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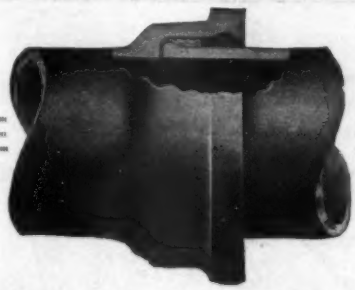

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The Cast Iron Pipe Publicity Bureau

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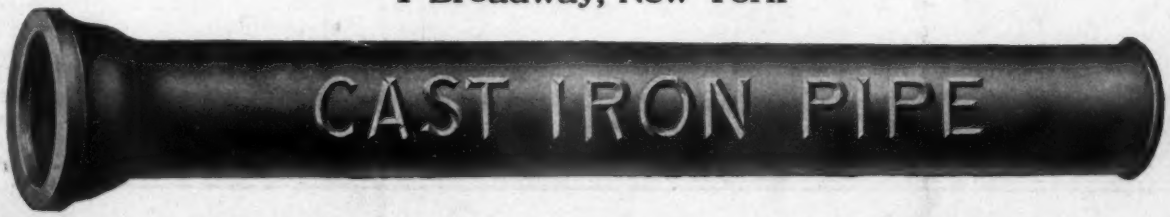

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The Gas Machinery Company

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Vol. CVIII, No. 20 NEW YORK, MAY 18, 1918 Whole No. 3141

With the Same Equipment Output Is Increased 30 Per Cent By Using Gas for Coffee Roasting

Difficulties Encountered in the Past in Converting Solid Fuel Equipment—Changes in the Physical and Chemical Structure That Must Be Brought About in the Roasting Process

By BRUNO RAHN

Industrial Engineer, Milwaukee Gas Light Company, Milwaukee, Wis.

Editor's Note: No one can doubt that there are innumerable branches of the industrial gas business that, though in normal times it would take years to make any appreciable headway in, we could put on our lines almost without effort to-day. And once there we know that we could hold them. The difficulty in the industrial end has been to convince others of what we already know.

It is particularly vexatious to the ambitious gas man that at the most propitious time to get the opportunity of letting gas speak for itself, reveal its merits by practical demonstration, he finds himself so tangled up with unprecedented demands and material difficulties that he cannot undertake conservatively any new big outputs.

Mr. Rahn's statement in this article, that the coffee-roasting business does not offer an excessively large revenue, is at this particular time more of an encouragement than a deterrent towards going after the business.

Coffee roasting belongs to gas in the fuel sense. Previous articles by various authors in this journal have made this clear. The present article adds new reasons why it is.

Present conditions make it easy to convert existing solid fuel equipments to gas. Likewise they have made necessary new departures in the bakery business that open up a field for new installations, as is revealed in an article in this week's merchandising section. The loads we can expect from it are uniform and not excessive. Therefore it should not hamper the average company much to go after the business. We should develop it while the times are propitious. Thus we may save ourselves years of effort and thousands of dollars of expense in the future.

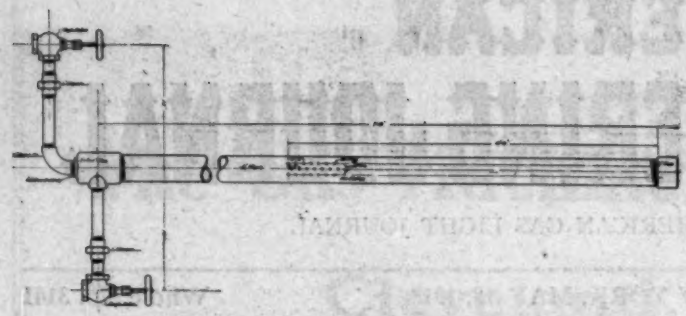
Though the advantages of gas fuel for coffee roasting are to-day no longer open to dispute on account of the universal success gas-burner installations for coffee roasting have met with, it is nevertheless a fact that even in our larger cities where gas rates are favorable numerous coffee roasters persist in operating with coke and coal fuels. Never were conditions more favorable towards conquering for gas the place of universal coffee-roasting fuel, to which, by virtue of its demonstrated adaptability and fitness, it is certainly entitled. It is therefore not amiss to review again the phases bearing upon this important branch of the industrial gas business, to become familiar with results so far obtained so as to be prepared to convert to the use of gas every remaining prospect.

Coffee in its natural state as imported by the trade is not in shape for domestic use. Certain important changes must be brought about in the physical and chemical structure of the bean before it attains those aromatic qualities which have given coffee the popularity which it enjoys as a home beverage. These results are brought about by skillful and exact roasting. Microscopic inquiry into the structure of the green coffee bean, which to the casual observer presents a tough and horny appearance, has disclosed the bean consists of a kernel composed of angular cells containing in the shape of tiny drops what is known as "caffeine," a fragrant, oily substance. This portion of the bean is enclosed by a two-layer membrane composed of long-shaped cells filled with a crystalline substance called caffeine and another in combination with it known as tannic acid.

Changes That Take Place in the Bean

The following definite changes take place in the bean due to the roasting process: The color changes from a green to a rich, glossy brown; the bean increases materially in size, the seam becoming more pronounced. There is a certain decrease in weight known as shrinkage, varying from 10 to 15 per cent.

The sugar content of the bean is greatly reduced, sometimes disappearing altogether. About one-half of the caffeine or aromatic essence, of which a good grade



BLAST AIR BURNER FOR COFFEE ROASTER

of coffee contains about 12 per cent, evaporates, becoming liberated during roasting. A conversion of the saccharine matter to caramel takes place. The fat cells of the raw bean burst. A partial dissociation of the caffeine from the tannic acid takes place. The imminent practical result of roasting due to the above chemical and physical changes is the greatly increased solubility of the roasted coffee in boiling water, it being practically double that of coffee in the raw state.

The degree of roasting thus determines the strength and flavor of the finished product, upon which in turn, of course, depends its commercial value.

Considerable skill, the result of extensive experience, characterizes the successful coffee roaster. The personal element enters to a great extent into the art of perfect coffee roasting. Under-roasting is as fatal as excessive roasting, much of the aroma being lost in either case. Proper quenching and proper cooling of the roasted products are of great importance. While it is possible to produce satisfactory results with coke or coal, a great many disadvantages peculiar to their use are eliminated by gas firing.

Many "Prospects" Afforded

Most every large wholesale grocery establishment of the present day maintains a separate department for roasting its daily output of coffees and peanuts. The aim is to roast only in such quantities as will take care of the daily demand by the trade. The machinery employed in the process of coffee roasting consists essentially of a roaster and its setting and the necessary conveyor apparatus for rebagging the coffee after it has been roasted and cooled.

The fundamental principle of the up-to-date coffee roaster is the same as that of the old-time coffee roasting drum, operated by hand power. The coffee is poured from bags into a revolving steel cylinder, whose walls are finally perforated to permit the heat to come into direct contact with the berries. A mechanical stirrer also revolves inside of this cylindrical drum, which constantly agitates the coffee during the process, so as to insure a uniform roast.

The drum is permanently set up in a brick setting with cast-iron furnace front, and over a grate designed primarily for the use of coke or coal fuels. The "Burns" and the "Lambert" coffee roasters are two representative types of this class of machinery, sample installations of which are shown in the cuts herewith.

From the standpoint of the industrial gas man, the coffee roasting industry offers a field of fruitful exploitation, yielding a uniform, though not excessively large, revenue. This fact has been recognized for some time by gas men generally, though only partial success has been had in displacing coke and coal with gas fuel. Though gas, considering fuel alone, is eminently suited for the coffee-roasting process, the problem presents the difficulty of changing over to gas an apparatus primarily designed for the use of coke or coal, and of doing this efficiently as to cost of operation

Little Co-operation from Coffee Roaster Manufacturer

There seems to be very little co-operation on the part of the manufacturer of coffee-roasting machinery as to encouraging the use of gas fuel by specially adopting the design of the setting for this, due, no doubt, to the fact that the general demand, on account of prohibitive gas rates in a good many localities, is for roasters operated with solid fuels. They did, however, go to the extent of adopting and manufacturing a gas burner so as to be able to meet the demand for gas fuel which came from certain localities, especially where natural gas could be had. These burners were of the atmospheric type, consisting, as a rule, of a number of oblong, box-shaped castings, drilled or slotted and attached to a common gas and air mixing tube. The operation of these burners was costly. The gas consumption was excessive, the burners being placed anywhere from 10 to 12 in. below the drum, in a spacious coal furnace setting, so that a great part of the heat was drawn by the draft directly into the exhaust flue and thus dissipated.

The mixers were in the ashpit, and due to the chaff and dust which invariably are found in green coffee

INSTALLATION OF TWO "BURNS" ROASTERS WITH GAS BLAST BURNERS AND WHITE GLAZED BRICK SETTING

were constantly clogged, requiring almost daily attention.

The element of danger connected with the use of such burners was considerable, and no doubt was one of the chief causes of delaying the general adoption of gas fuel for coffee-roasting purposes.

An attempt was made to retain heat and render the burner more economical by distributing refractory material over the face of the burner in the shape of fireclay rings, or so-called "fried cakes." They also served the purpose of relighting the burner when the roast was completed and the coffee had just been quenched. This proved to be an unreliable proposition, however, and the crumbling and disintegration of this material, which naturally took place in the course of time, only added to the discomfiture of the operator.

BATTERY OF EIGHT COFFEE ROASTERS CONVERTED FROM COAL TO GAS

Introduction of Blast Air

The introduction of blast air in connection with a drilled pipe burner has been instrumental in cinching for gas the place of an ideal coffee-roasting fuel. The sketch illustrates a burner of this type which was designed to hold a battery of coffee roasters on gas which had been operated with atmospheric burners with very uneconomical results. This burner is made of 3-in. wrought-iron pipe, 7 ft. 8 in. long, with holes drilled in three parallel rows for a distance of 4 ft. from the cap as shown, the remaining 3 ft. 8 in. of 3-in. pipe acting as mixing chamber for air and gas. The burner is introduced under the drum from the rear of the roaster, its position being such that its top face is about 3 in. below the bottom surface of the drum.

Gas and blast air are supplied from the rear of the roaster. Both can be controlled, however, by the operator at the front by means of valve rod extensions, which are provided for this purpose. The burner operates under 8 oz. of air pressure, furnished by a positive blower, driven by the same power unit which operates the rotary mechanism of the roaster. A suitable system of pilot lights is provided for, consisting of one main pilot light and a secondary one, which burns constantly, avoiding all chance for an explosion.

Both the "Burns" and the "Lambert" roasters are equipped, when the demand is made, with blast burners, the former using a positive blower, while the latter operates on fan blast. In arrangement the two differ in that in the "Burns" roaster the gas and air blast connections to the burner are made in the rear, while in the "Lambert" roaster the air is connected at the rear, and traveling forward mixes with the gas at the front of the roaster.

Roasters are usually set up in batteries of two, three or four, as illustrated by accompanying cuts. The average consumption per roaster per month, based on continuous eight hours a day operation is about 30,000 cu. ft. of gas (625 B.t.u.)

The following is a tabulation of several tests made with the burner shown in sketch, and also one test made with a "Burns" pipe burner:

Burner Used	Lb. Coffee Roasted	Cu. Ft. Gas Used	Cu. Ft. Gas Used Per 100 Lb. Coffee Roasted
"Burns"	10,228	9,150	89.5
3-in. W. I. pipe burner	3,751	3,175	84.6
3-in. W. I. pipe burner	3,232	2,675	82.7
	19,699	15,565	79.0

The best result that could be obtained from the same roaster operating on atmospheric burners was a consumption of 102 cu. ft. of gas per 100 lb. of coffee roasted. The time per roast of two bags of coffee, average weight of 135 lb. net each, was about twenty-five minutes. The air pressure the burners operated on was 8 oz. The above consumption figures include the gas consumption of the pilot lights in each instance.

Selling Points

The constantly increasing price of coke and coal, as well as stricter factory regulations as to cleanliness and sanitation, favor the use of gas as being the one suitable coffee roasting fuel. The time saved, when using gas fuel for this purpose alone, is a deciding factor. The average time per roast with coal, for instance, is never less than forty minutes. Contrast this with the period of twenty-five minutes cited in the above tests. In addition to this the labor expense for handling the solid fuels, tending and building fires, wheeling away ashes, must be considered, whereas gas has the advantage of "ever-readiness of service." With the same equipment, therefore, the output is increased over 30 per cent when operating with gas. The absolute heat control and close regulation at the command of the operator when using gas insure absolute uniformity of the roast, a requisite of utmost importance. Not having

INSTALLATION OF THREE "BURNS" ROASTERS CHANGED FROM COAL TO GAS

to mind the fires, the operator is free to devote his entire attention to the roasting process, which in itself would tend towards making the finished product more perfect. When using gas the coffee roasting department can readily be located on the top floor of the building, an arrangement not very economical or desirable when coke or coal are used, not only on account of the increased handling cost, but also because of the annoyance caused by smoke, dirt and ashes.

The use of gas decreases the fire risk, hence lower insurance rates. The absence of radiated heat adds to the comfort of employees. The maintenance of the blast gas burner is practically nothing. The setting with gas will last forever; there are no grate bars to be renewed nor will the setting deteriorate. The absolute cleanliness existing where gas is used as coffee-roasting fuel is apparent from the photographs, a factor whose advertising value cannot be overrated.

"Early Ordering" Campaign Has Stimulated Coal Production

Although the "early ordering" campaign has practically only begun, its effects are already being felt in increased production. The week ending April 27 showed, according to the reports of the United States Geological Survey, a total production of 11,668,000 net tons, an increase of 5.7 per cent over the preceding week. The average production per working day was 1,946,000 net tons, compared with 1,840,000 net tons the week previous, and 1,680,000 net tons during April, 1917.

The week ending April 27 recorded not only the highest rate of production for the past twelve months, but was the third successive week of rising production.

There was also a gradual improvement in car service conditions in the mines during the week ending April 20. Loss of production due to car shortage throughout the entire country was 16.2 per cent as against 18.1 per cent in the preceding week. The loss due to labor shortage was 4.8 per cent as against 3.8 per cent.

The reports showed an improvement in the demand for coal, due to the co-operation of coal consumers with the Fuel Administration's campaign for early ordering. The loss of production due to "no market" in the week ended April 20 was only 1.8 per cent for the country as a whole, as against 2.8 per cent in the preceding week.

The loss due to "no market," however, is still large in the States west of the Mississippi River, where summer production must be maintained if the consumers are to avoid a serious coal shortage next winter. The mines in these States have ample capacity to care for the consuming territory allotted them under the zone system of distribution, but these mines must be kept at work at maximum capacity throughout the year in order to provide a proper supply.

The mines of Kansas and Missouri showed a loss of production of 7.5 per cent due to lack of demand. Those of Oklahoma and Arkansas showed a falling off of 9.3 per cent, due to the same cause. Iowa mines lost 30.7 per cent of their production because buyers were not available, the Pacific Coast States showed a loss of 5.8 per cent, due to this cause, and the Rocky Mountain States a loss of 12.3 per cent.

While all of these figures showed an improvement as compared with previous weeks, the Fuel Administration will make a determined effort to eliminate all loss of production due to lack of market.

New York Gas Company's Women Appliance Inspectors Make 1,500 Calls a Week

Since the past few months twenty women go forth every morning prepared in the service of the Consolidated Gas Company, of New York, to inspect gas appliances, advise housewives on the care necessary for their ranges and perform what may be called "minor operations" on the ranges inspected. When the inspectors return at night, after having made twoscore visits or more, they have added materially to their knowledge of cooking appliance diseases and have acquired much new information concerning human nature.

Armed with a black leather bag, each appliance inspector knows that with her kit of tools she can make many small repairs while she takes occasion to discourse on the well-known fact that cleanliness means efficiency in a gas range and that a little care every day means cleanliness. In addition to the tools in the leather bag, which include pliers, a screwdriver and a reamer, there is a bundle of slips listing the calls to be made. Some of the slips bear names and addresses of persons who have telephoned to the gas office for assistance in some difficulty, but the majority of addresses are given out to the inspectors with instructions to call and ask to be permitted to inspect cooking appliances.

In homes where everything is found in excellent condition the call is of short duration, but oftentimes, even when there has been no request for aid, suggestions as to care of the range are gratefully received.

At a conservative estimate the inspectors make 1,500 calls a week, which brings their yearly total up to 78,000.

Denver Women Do Own Housekeeping

Eighty per cent of Denver's women are doing their own housekeeping now because of war conditions, and are lightening their labors by the use of labor-saving appliances. This estimate was arrived at after a thorough canvass by Frank Kivel, publicity manager of the Denver Gas & Electric Light Company. The desire for simple living has naturally introduced to many women such appliances as washing machines, sweepers and dishwashers.

Measurement of Natural Gas in Large Quantities

Direct-Reading Orifice, Not Yet Devised, the Ideal Meter—Proportional Meters, Pitot Tubes, Orifice, Venturi and Electric Meters; Their Advantages and Shortcomings

By W. M. ACKERMAN
Weehawken, N. J.

This paper begins with a short general discussion of the various types of meters in use for the measurement of high-pressure natural gas in large quantities, and then deals at somewhat greater length with the orifice meter. This type of meter has been greatly improved since its first use for gas measurement some seven years ago, and there are many gas men who look to see it become even more popular in years to come.

One of the most important developments in the natural gas industry during the past five years has been the general desire for greater accuracy in measurement. In every section of the country, engineers have looked into the problem, investigating and improving upon the types of meters already in use, and applying other principles to new types of meters. Considerable experimental work has been and is now being done by all the larger pipe-line companies, also by some meter manufacturers, and unquestionably great strides have been made in this period.

The future, however, still leaves a great deal to be accomplished. Probably the thing most to be desired would be a general acceptance as standard of some one or two of the forms of measurement now in use. If all efforts were concentrated upon a few types of meters, the two most necessary improvements, viz., simplifying the calculation of a meter's delivery and decreasing the meter's liability to derangement, would probably be found easy of solution.

Types of Large Capacity Meters in Commercial Use

Gas meters might be roughly classed as direct or "positive" and indirect or "inferential." A direct or positive meter is one where all the gas is actually measured by displacement from alternately filling and emptying chambers. The mechanism of such a meter is comparatively simple. This type is much used in artificial gas, but would prove too cumbersome and expensive for natural gas. Besides, natural gas is nearly always measured (when in large quantities) at high pressures, which fact alone would bar these meters. The so-called "positive" meter used in the natural gas industry is also a direct meter, but is made to measure only relatively small quantities of gas. Meters of the direct type have reached a high state of perfection, and give uniformly satisfactory service.

Among the meters of the indirect or "inferential" type now used in measuring natural gas, the following might be mentioned: proportional meters, Pitot tubes, orifice meters, Venturi meters and electric meters.

Unquestionably the proportional meter is to-day the best known of those just enumerated. In this meter, the gas to be measured is divided into a large and a small channel, the ratio of 1 : 50 being the most usual. The small quantity of gas is measured by an ordinary positive meter. The fact that the gas has been divided is taken care of in a multiplying dial register, and the meter is direct reading. However, if gas under pressure is being measured, it is necessary to correct the meter reading by a multiplying factor. The mechanism of all makes of proportional meters is most ingenious, and if natural gas were a clean, dry vapor, this type of meter would give little cause for criticism. The best condition for proportional meter operation is found usually where the gas is furthest from the field, and is consequently comparatively clean. This type of meter is considered better suited to a greatly fluctuating load than most of the others.

The Pitot tube is well known to gas men through its use in the so-called "open-flow" gauging of wells. Under certain conditions, it has given complete satisfaction. The most refined form of this installation consists of a Pitot tip permanently set in a tube of polished brass. The fragile nature of the tip and the low readings for the differential pressure are the two most important objections. Deliveries through a Pitot tube are calculated by the same formula as for an orifice meter, and the advantages of the latter form of meter have prevented the tube from becoming as popular in gas as it is in steam and air measurement.

The Venturi meter has been employed only in the very largest meter installations. The special type of gauge, and its integrating device, makes the Venturi probably the best meter available to-day for meter stations so large that the original cost is not a large factor. However, the cost is considerably greater than for the other types, and the Venturi is inferior to an orifice installation as far as flexibility is concerned.

The electric (Thomas) meter is another expensive type. It operates on the principle of electrically imparting a small quantity of heat to all the gas passing through the meter. The index of a watt-hour meter is made to read direct in cubic feet of gas—this is the only high-pressure meter available where a simple subtraction gives the meter's delivery regardless of pressure, gravity or any other factor. This meter is not available except where electric power is at hand.

The Development of the Orifice Meter

The use of a calibrated orifice in natural gas measurement is a comparatively recent development, the first orifice installation in this country being made by H. C. Cooper in West Virginia late in 1911. The well-known principle of the flow of a field through a thin-plate orifice is very simple of application to natural gas measurement, and from the start this type of meter seemed to give promise of the best results.

The last five years have seen a great increase in the

number of Pitot and orifice meter installations, especially the latter, due to the development of satisfactory differential pressure gauges, for recording small differences in pressure between two high static pressures. Before these gauges were put on the market, this differential pressure was indicated on an ordinary water column. In those days it was necessary to have two observers, working twelve-hour shifts, at each meter station to record quarter-hourly readings of the differential. Except in the very important measuring stations, this meant a prohibitive operating cost.

Description of the Orifice Meter

An orifice meter consists of a calibrated disc set in the gas pipe line, two gauges (indicating or recording, usually the latter) to show (1) the "static" pressure of the gas, and (2) the drop in pressure, or "pressure differential," across the orifice disc, and a pair of small lines connecting the gauges and the pipe line. The disc is usually made of iron or steel plate, and for the sake of convenience is inserted in a flange union.

All orifice meters in use can be classed directly in one of two groups—"close connection" or "distant connection." In meters of the former type, the gauge line connections are made right at the flange; that is, the "high" and "low" pressures are taken within an inch or two of the orifice disc. In meters of the distant connection type, the high-pressure connection is two and a half times the diameter of the pipe line ahead of the orifice disc, and the low-pressure connection is eight times the diameter of the pipe behind the orifice in the line.

These particular values, two and a half and eight times the pipe diameter, have been found to bring the connections beyond all eddy-current effect for any commercial flows. While there is no evidence to show that the presence of eddies would affect the accuracy of any measurement through the disc, some engineers have preferred to eliminate this source of possible uncertainty.

The formulæ and general statements contained in this paper apply equally to both close and distant connection types. There are also given herein values of constants for various sized discs; it is to be noted carefully that these apply only to the distant-connection meter. This later meter was developed in the United States by a large pipe-line company operating in the Middle West, and this company has seen fit to publish at least a very large part of the results of their experiments. The makers of the close-connection meter, as far as the writer is aware, have never made public the values of their constants.

Formulæ for Orifice Meters

The following formula is derived theoretically by T. R. Weymouth* from the expression $V = \sqrt{2gh}$. It gives all the factors entering into the measurement of a gas flow by an orifice:

$$Q = 218.44\, Ed^2 \frac{T_o}{P_o} \sqrt{\frac{h\,P}{T\,G}} \qquad (1)$$

Where Q = rate of flow of gas (or air) in cubic feet per hour.

*"Measurement of Natural Gas." Paper read before the American Society of Mechanical Engineers, No. 1376, December, 1912, Proceedings, Vol. 34.

T_o = standard temperature, in absolute degrees Fahr. at which Q is expressed.

P_o = standard pressure, in pounds absolute per square inch at which Q is expressed.

E = velocity coefficient, sometimes known as the "efficiency."

d = diameter of the orifice in inches.

h = pressure drop across the orifice, expressed in inches of water.

P = static pressure of the flowing gas, pounds absolute per square inch.

T = temperature of the flowing gas, degrees Fahr. absolute.

G = gravity of the flowing gas, where air equals 1.00.

It is noteworthy that E, the velocity coefficient, is a constant for any meter—that is, it does not change in value unless the size of the disc or of the pipe line be changed. As a rule, this constant is not used in calculating deliveries through an orifice. Its usefulness lies principally in the mathematical analyses of formulæ, and for purposes of comparing experimental data of tests made under widely differing conditions.

It is by means of formula (1), or of a similar formula, that orifice meter discs are calibrated. A known quantity of gas (or air) is passed through the meter and readings of all quantities are made. These values are substituted in formula (1), and then E, the efficiency, the only unknown, can readily be solved for. During such calibration tests, the volume of the gas or air passing through the meter is determined either by passing it first through a standard meter of known accuracy, or else by taking the gas directly out of a holder and determining the volume by displacement. The latter method, being direct in that it does not depend upon a second meter, is preferred by most engineers.

The formula ordinarily used in the calculation of an orifice meter's delivery is

$$Q = C\sqrt{h\,P} \qquad (2)$$

Where C is a constant, the "coefficient" of the disc, discussed later.

Q is the quantity passing through the meter, cubic feet per unit time.

h is the differential drop across the orifice disc, expressed in inches of water, as this is the unit used in all commercial differential pressure recording gauges.

P is the static pressure of the flowing gas, pounds absolute per square inch.

By equating (1) and (2), we get an equation connecting C, the coefficient used in practice, and E, the velocity coefficient:

$$C = \frac{218.44\, Ed^2\, T_o}{P_o \sqrt{T\,G}} \qquad (3)$$

E and d are constant for any meter. It is evident from the last equation that in practice T_o, P_o, T and G are not considered variables. This practice is absolutely accurate as regards P_o and T_o. These values are fixed by custom, contract or law. An accurate measurement as regards T and G would require a continuous record of these values, and if this were possible, it would make an exceedingly complex process of the calculation of an orifice's delivery. The way it is done in practice is to

make a monthly determination of the gravity, G, by test, and to have that value apply for the ensuing month; also to use an average flow temperature figure for T the full year around. Whenever a gravity test shows a change in the value, a new coefficient must be used. In natural gas practice there is usually a steady change in gravity at a meter in one or the other direction. If monthly changes in the coefficient are made as a result of a changing gravity, it would be feasible to vary the value for T, the average flow temperature, at the end of each month, instead of using the all-round average value. This, however, is not done, although the plan has advantages.

Changing Coefficient for Changed Conditions

The method of changing a given coefficient for an orifice to the correct value to allow for changed conditions is most important, and very little understood. A great many meters seems to be run on the theory that any old coefficient at all will do. The writer has known of cases where no gravity correction was made for gas, i. e., where the air coefficient was used. There are probably dozens of meters in Oklahoma using a 0.6 gravity coefficient, just because this has been taken as a fair average in certain Pennsylvania fields. Pressure base corrections seem to be difficult, and the temperature relationships are understood least of all.

To merely state that an orifice coefficient is so much is to give practically no information at all. Whenever the value of a coefficient is given, all the factors entering should be stated, unless these are clearly understood. Whenever an orifice meter or disc is purchased, this is especially important, for meter manufacturers can never predict the exact conditions under which a meter is to be used.

Simply stated, the "coefficient" of an orifice is the number of cubic feet of gas or air passing through the meter, when the drop in pressure across the orifice is 1 in. of water, and the gas or air is under a pressure of 1 lb. (absolute) per square inch. Obviously then, a given coefficient is meaningless unless it gives full information as to (1) unit time, (2) gravity of gas, (3) assumed average flowing temperature, (4) temperature base, or "storage" temperature, (5) pressure base, including assumed average barometer.

How to correct from an assumed standard to a new condition will now be shown in detail for each of these factors.

Time: The most convenient unit is the hourly coefficient. A twenty-four-hour coefficient is twenty-four times the hourly value; a fifteen-minute coefficient is one-quarter the hourly value, and so on. Some years ago quarter-hourly coefficients were the only ones used, because in the days before the recording differential gauge quarter-hourly readings from indicating gauges were written down by station men.

Gravity: No measurement is correct unless based on the correct gravity of the flowing gas. The lighter the gas (i. e., the lower the gravity, the higher is the coefficient in a square root relation. Expressed as a formula:

$$\text{Correct coefficient} = \text{old coefficient} \times \sqrt{\frac{\text{old (assumed) gravity}}{\text{new (correct) gravity}}}$$

Flow temperature: No measurement is exactly correct except when the coefficient is based on the actual flow temperature. In the case of a permanent meter, the use of a coefficient based on an average flow temperature value will balance out any slight irregularity. The colder the gas (lower temperature), the higher the coefficient, again in a square root relationship:

$$\text{Correct coefficient} = \text{old coefficient} \times \sqrt{\frac{\text{old (assumed) flow temperature average}}{\text{New (actual) flow temperature}}}$$

Flow and "storage" temperature: This is the most important case. If a correction is made to actual flow temperature, the measurement is correct, but the volume will be expressed in cubic feet at To degrees, the "storage" temperature. In many cases this is not convenient. For example, in comparing an orifice and a displacement meter, the gas passing through the orifice must be expressed in cubic feet at its own temperature. This involves a change of both flow and storage temperature. If this is done, the formula becomes:

$$\text{Correct coefficient} = \text{old coefficient} \times \sqrt{\frac{\text{old (assumed) flow temperature average}}{\text{new (actual) flow temperature}}} \times \frac{\text{new "storage" temperature}}{\text{old "storage" temperature}}$$

Example: An orifice has a coefficient 283.0 at 40 deg. flow temperature and 50 deg. storage temperature. It is passing gas at 87 deg., all other conditions remaining unchanged. What coefficient will give the correct measurement and express the delivery in cubic feet at 87 deg.? Solution:

$$\text{Correct coefficient} = 283.0 \times \sqrt{\frac{500}{547}} \times \frac{547}{510} = 290$$

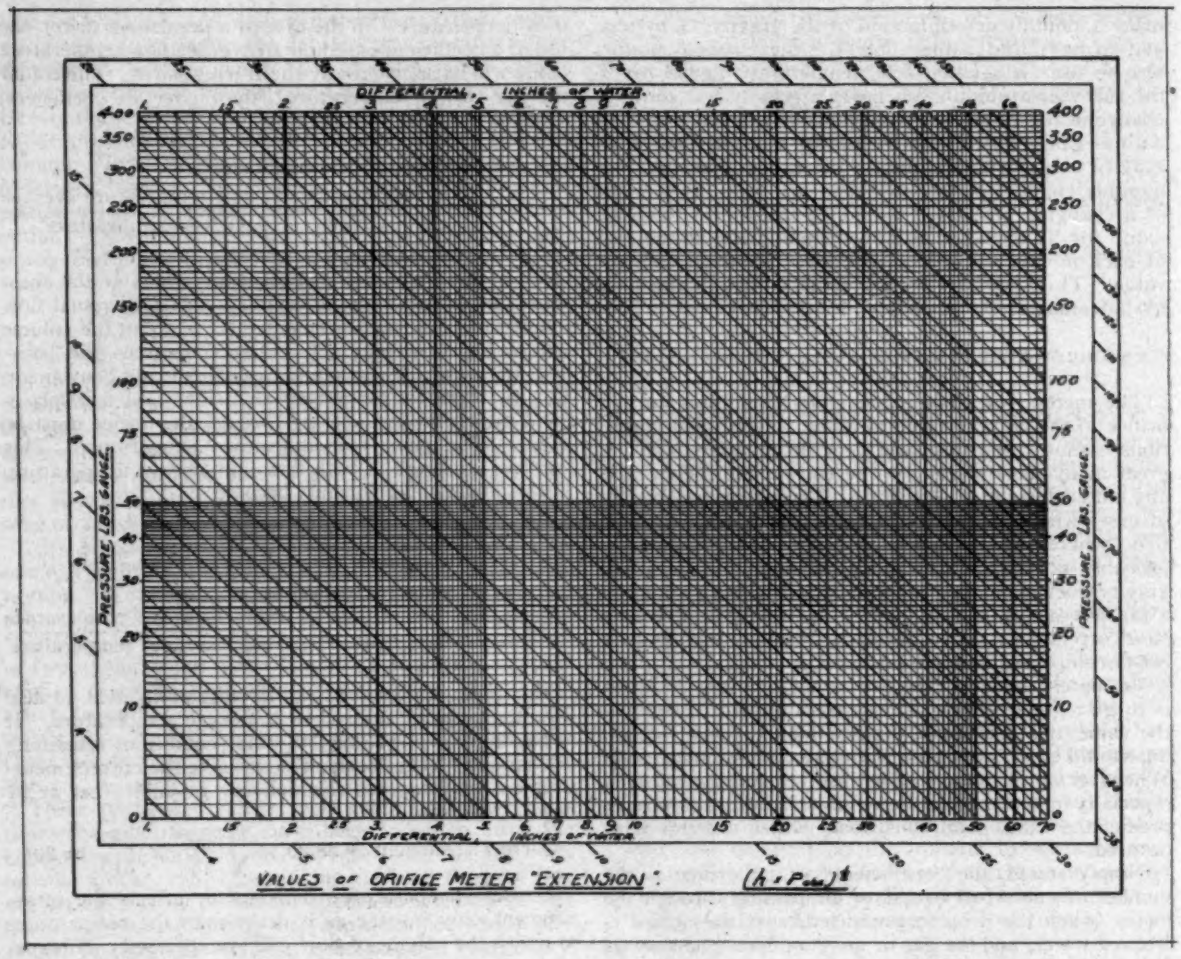
Storage temperature: This factor affects the measurement only insofar as it determines the temperature at which the volume of flow will be expressed. This correction is simple and well known:

$$\text{Correct coefficient} = \text{old coefficient} \times \frac{\text{new "storage" temperature}}{\text{old "storage" temperature}}$$

Pressure base: This factor, similarly to the last, affects the measurement only in determining the pressure at which the meter's delivery is expressed. It is a rather important factor, however, inasmuch as practically all natural gas is paid for on some pressure base measurement—4 oz., 10 oz., 2 lb., etc. There are two factors in this pressure base: one, the nominal pressure (4 oz., 2 lb., etc.); second, the average barometric pressure. The greater the pressure base (expressed in absolute units), the smaller the coefficient:

$$\text{Correct coefficient} = \text{old coefficient} \times \frac{\text{old pressure base plus old barometer}}{\text{new pressure base plus new barometer}}$$

The following example brings in several of the corrections just described: A disc whose fifteen-minute coefficient for 0.59 gravity gas, 2-lb. pressure base above 14.7 lb. is 3,247, is taken to a field where the average barometer is 14.4 lb., to measure 0.64 gravity gas at 10 oz., pressure base. What is the hourly coefficient, temperature unchanged?



Solution

$$\text{New coefficient} = 4 \times 3{,}247 \times \sqrt{\frac{0.59}{0.64}} \times \frac{2 + 14.7}{0.625 + 14.4} = 13{,}820$$

Relationship Between E, C and C_a

In the Eastern fields, T_o is taken as 510, T as 500; in the mid-continent, T_o and T are both taken as 520. P_o is everywhere 14.4 lb. normal atmospheric pressure. Substituting either the Eastern or the mid-continent values for T_o, P_o and T in equation (3) gives the same result, viz.:

$$C = \frac{346\ E\ d^2}{\sqrt{G}} \qquad \ldots\ldots(4)$$

The 10 deg. difference in T_o affects C directly, and exactly counterbalances the 20 deg. difference in T, which is applied inversely as the square root. If in equation (4) G is taken as unity, the equation becomes:

$$C_a = 346\ E\ d^2 \qquad \ldots\ldots(5)$$

Where C_a is the "air coefficient" of the orifice.

A comparison of the two foregoing formulæ shows that

$$C = \frac{C_a}{\sqrt{G}} \qquad \ldots\ldots(6)$$

This expression shows the usefulness of the value C_a. It does not vary for a given disc, unless the assumed standards are changed. C, the gas coefficient, on the other hand, being a function of the gravity of the flowing gas, will vary, and the gas coefficients of identical discs would be different if the discs were passing gases of different gravities. Orifice disc calibration tests are therefore usually figured for C_a, the air constant, and this is the value that is recorded. Whenever a disc is put in line at a measuring station, the gravity of the gas to be measured is found by test, and the proper gas coefficient calculated.

Values of Coefficients

The latest values for coefficients for the distant connection meter are contained in a paper read by F. P. Fisher before the American Society of Mechanical Engineers in December, 1916.* This paper gives results showing that E, the "efficiency" of an orifice varies only with the ratio of orifice diameter to pipe diameter, and is independent of the size of pipe line. In other words, a 3-in. orifice in a 6-in. pipe line (called 6 x 3 in. for brevity), has the same value for E as has a disc 4 x 2 in.

or 8 x 4 in. The values C or C_a, however, would not be the same for the three discs just mentioned, these values being proportional to the product $E d^2$ (see equation 3).

Mr. Fisher's paper contains a curve giving values of E for all values of the ratio d/D (D is the diameter of the pipe line in inches). These values are approximately as follows:

d/D	E	d/D	E
0.10	0.610	0.40	0.678
0.15	0.615	0.45	0.702
0.20	0.623	0.50	0.735
0.25	0.633	0.55	0.778
0.30	0.645	0.60	0.830
0.35	0.660	0.65	0.896
		0.70	0.975

Theoretically it would be necessary to get the actual inside diameter of the pipe down to thousandths of an inch in finding d/D. In practice this is a waste of time, on account of the probable experimental error in the above figures being much greater than any possible variation in E in a few thousandths of an inch in the pipe diameter. Of course, d, the diameter of the orifice, must be accurate to at least 0.001 in.

By means of equation (3), the coefficients for any sized disc, for a distant connection-type meter, can be readily computed. If the value of d/D is not shown in the table just given, values can be interpolated mathematically or by drawing the curve. It is considered inadvisable to go to disc sizes larger than d/D equals 0.70, because of the fact that the efficiency curve becomes so steep that the possible experimental error becomes a large factor.

The writer has found the set of curves shown herewith very useful. The value of C for all ordinary disc sizes in 3, 4, 6 and 8-in. pipe lines can be read off directly for any gravity and pressure base. They can be used, of course, not only for natural gas, but for any other gas, including air.

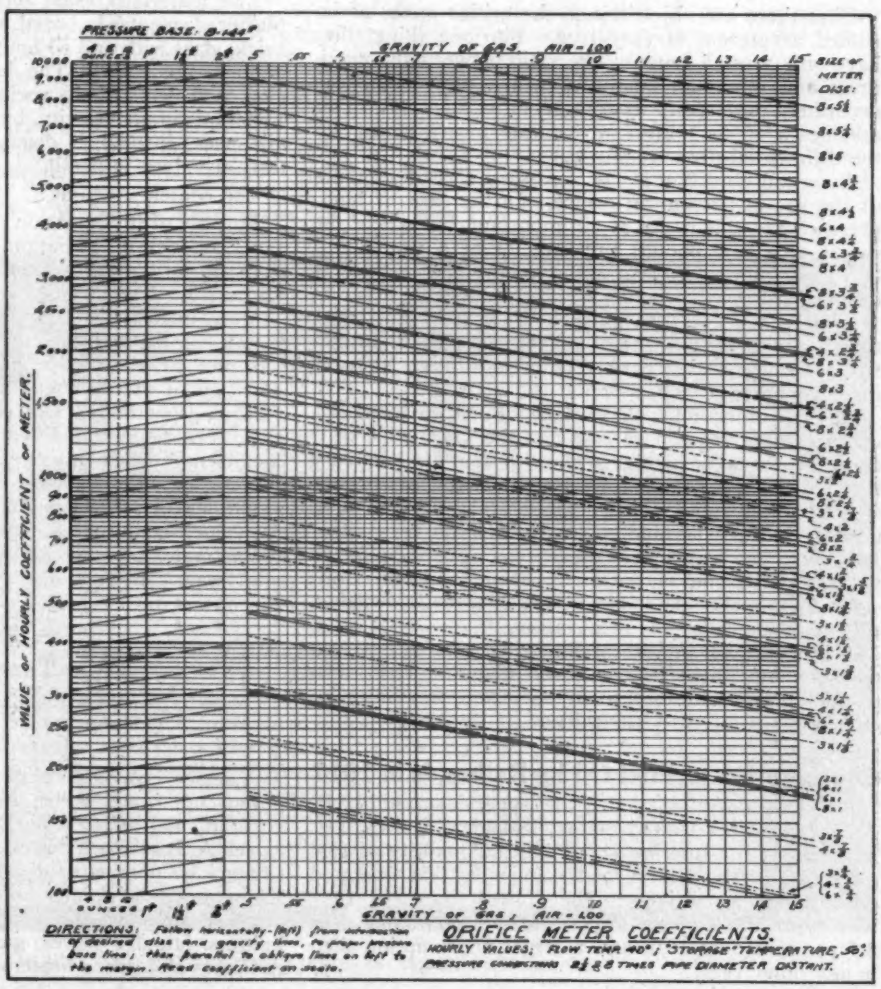
Calculation of a Meter's Delivery

In the calculation of the delivery as $C \times \sqrt{h P}$, it is rarely necessary in practice to go through the square root process mathematically. All users of orifice meters supply themselves with so-called "extension" books, in which are listed, correct to three decimals, all values of h P; for values of h from 0 to 100, and of P from 30 in. vacuum to 500 lb. These books are of such a size that they are nearly always kept in the office. For field work, the writer has drawn up the log-paper curves shown. These curves require specially drawn cross-section paper, inasmuch as P in the expression $\sqrt{h P}$ is in pounds absolute, whereas it is more convenient to use pounds gauge in plotting.

Most users of orifice meters find that the most satisfactory method of taking values of h and P from the recording gauge charts is by visually averaging these values and recording hourly or three-hourly averages. Extensions for these averages are found, totalled up, and then multiplied by the hourly (or three-hour) coefficient, giving the day's delivery.

In relatively few cases is the planimeter used. The principal reason for this is because averaging by eye

*"Establishing a Standard for the Measurement of Natural Gas." Am. Soc. Mech. Engrs. Proc., Vol. 38, p. 241.


PRESSURE BASE: 8-14.4#
GRAVITY OF GAS, AIR = 1.00
VALUE OF HOURLY COEFFICIENT OF METER.
SIZE OF METER ORIFICE
DIRECTIONS: Follow horizontally-(left) from intersection of desired disc and gravity lines, to proper pressure base line; then parallel to oblique lines on left to the margin. Read coefficient on scale.
ORIFICE METER COEFFICIENTS.
HOURLY VALUES; FLOW TEMP. 60°; "STORAGE" TEMPERATURE, 58°;
PRESSURE CONNECTIONS 2½ & 8 TIMES PIPE DIAMETER DISTANT.

has been found to produce much better results from the standpoint of accuracy. The planimeter can accurately get a twenty-four-hour average value of the differential or the static pressure, but inasmuch as both these terms are brought into the orifice equation under the radical, the value really wanted in the calculation is the average value of the square roots of (say) hourly differential or static readings. Also, the values of h and P vary independently during the entire twenty-four hours, and there is quite frequently a ten-to-one variation in the differential and at least a two-to-one variation in the pressure. By taking hourly extension values, as described, the simultaneous values for any hour of h and P alone are used to calculate the flow.

As an illustration of the use of the two curve sheets, let us calculate the rate of flow through a 6 x 3¼-in. disc, gravity of gas 0.66, pressure base 8 oz., when the differential reading is 16 in. and the static 140 lb. (gauge). The first set of curves shows the gas coefficient to be approximately 3,350; the value of the extension, as taken from the other set of curves, is 49.7; their product gives a flow of 166.6 M cu. ft. per hour, or very nearly 4,000,000 ft. per day.

Advantages and Disadvantages of the Orifice Meter

That there are objections to the orifice meter as installed at present is very true. For one thing, they have only a small range. The ratio between the maximum and minimum quantities which any orifice can accurately measure is usually given as 3.5 to 1. This assumes a 10 to 1 ratio of accurate measurement for the differential pressure gauge.

A second objection is the necessary loss of pressure of the gas in passing an orifice. In the case of high-pressure gas, this is not at all important, but where the gas is at a few pounds pressure, or at a vacuum, it becomes a matter of great importance. The coefficients of most orifices vary somewhat for excessively low differentials, say less than an inch of water. This fact, together with the absence of reliable differential gauges for such minute differentials, requires differential readings averaging perhaps a pound (27 in. of water).

Another objection is that it takes a mathematical calculation involving square root and the knowledge of a constant for a particular orifice to find the delivery through the meter. In a good many cases this is considered an advantage, in that the delivery through such a meter does not become public information very often. However, an integrating, direct-reading orifice meter will certainly be put on the market sooner or later. Considered from the standpoint of our present knowledge, this might be called the ideal meter.

Among the advantages of the orifice for natural gas measurement might be mentioned low first cost, simplicity of installation, ease of operation, flexibility by changing size of disc, ruggedness of construction.

Consumption of Fuel Oil by Railroads in 1917

Statistics compiled under the supervision of J. D. Northrop, of the United States Geological Survey, Department of the Interior, show that the quantity of fuel oil consumed by all railroad companies that operated oil-burning locomotives in the United States in 1917 was 45,707,082 barrels, a gain of 3,580,665 barrels, or 8.5 per cent over 1916 and a larger consumption than in any other year.

Publications

A Study of Heat Transmission in Building Materials

Bulletin 102 of the Engineering Experiment Station, University of Illinois, 9 x 6 in.; paper backed; 60 pages, illustrated. Published by Engineering Experiment Station, University of Illinois, Urbana. Supplied gratis on request.

An investigation to determine the coefficients of heat transmission of standard building materials for exterior walls, completed by the Engineering Experiment Station of the University of Illinois, under the direction of A. C. Willard, professor of heating and ventilation, and L. C. Lichty, research fellow. The tests were conducted according to the so-called "hot-air-box" method, the boxes being built of the material to be tested and of such size as to insure conditions similar to those found in actual practice. The heating was done electrically, so that the input of heat could be controlled and accurately measured.

The materials tested included various sizes of tile plastered, magnesia board, cork board, wood, concrete, brick, glass with and without an air space, sheet asbestos and asbestos board. The degree to which the transmission coefficients of the various materials are affected by variations in air velocity, by humidity and by the use of air spaces in wall, is discussed, and the results of the tests are given in detail.

The contents include:

Purpose of investigation; Principles of heat transmission, conduction, radiation, convection, heat transmission to, through and from a simple wall; Methods of testing for heat transmission of building materials; Testing methods and equipment—the ice-box method, the oil-box method, the cold-air box method, the hot-air box method, the flat or hot-plate method; The determination of the heat transmission coefficient under the foregoing methods; Description of specimen, testing apparatus and method of conducting tests; Still-air tests, coefficients of heat transmission; discussion of results; Moving-air tests, discussion of results; the effect of variations in relative humidity on surface coefficients, the value of air spaces; Applications of data to typical simple and compound walls, types of wall construction, solid wall construction, air space construction; Conclusions.

War Time Cookery

Colored-paper-backed booklet; 7¼ x 5¼ in.; 56 pages, illustrated. Published by Peoples Gas Light & Coke Company, Peoples Gas Building, Chicago, Ill.

A set of economy recipes tastefully and attractively gotten up, interspersed with publicity matter setting forth in good selling styles, the merits of Reliable, Clark Jewel, A. B., Detroit Jewel, Acorn, Garland, Eclipse and Champion Combination gas ranges; the gas-fired garbage incinerator; the Zander automatic refrigeration system, water heaters, washing machines, clothes driers, range lighters, laundry stoves, gas irons, gas lights, gasteam radiators and space heaters, the Bryant gas boiler, etc.

How the Gas Companies Are Helping the Nation

THE BROOKLYN (N. Y.) BOROUGH GAS COMPANY employees have subscribed for $5,700 worth of Liberty Bonds through the office manager of the concern, Miss M. E. Dillon, who has a brother in the service. The company has taken up about the same amount in the past two loans. Each time the employees showed a willingness to buy the bonds outright. Every employee in the concern is a holder of at least one bond of each of the loans.

C. J. Ramsburg Appointed Technical Expert on Toluol

C. J. Ramsburg, vice-president of the H. Koppers Company and of the Pittsburgh By-Product Coke Company, has been appointed "technical expert on toluol" in the U. S. Ordnance Department as assistant to Col. C. W. Watson. It is the intention of the Government to largely augment the available supply of toluol by new construction of coke ovens, water gas and coal gas stripping plants and oil cracking processes, and the wide experience of Mr. Ramsburg not only in the Koppers company, but in his former work with the United Gas Improvement Company, will aid the Ordnance Department in this work. He will take up the new work in addition to present duties, spending a portion of each week in Washington. Mr. Ramsburg has been largely instrumental in the development of the water gas stripping process, and his company is now building a large number of these plants all over the United States.

Third Liberty Loan Subscriptions of Welsbach Company and Employees Exceed Gloucester City's Quota

Gloucester City oversubscribed its quota of the Third Liberty Loan more than sevenfold. Its population is 12,000; its quota was $76,000.

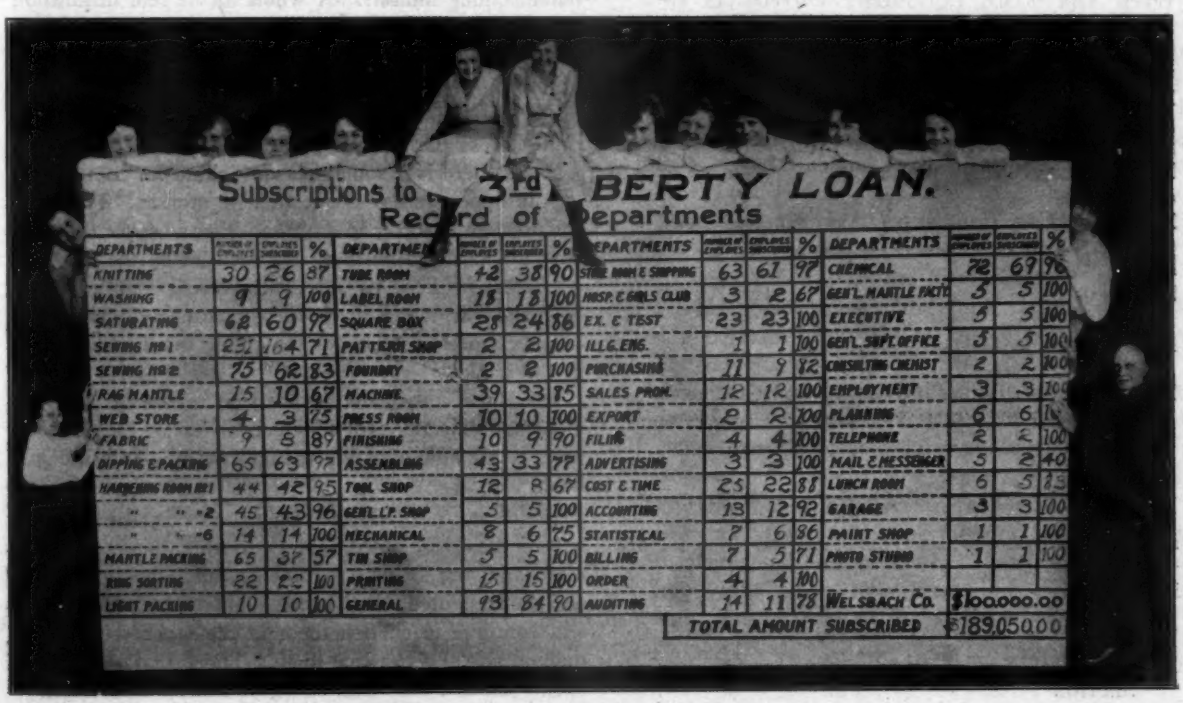
Total subscriptions received, $582,750 from 6,636 persons.

Employees of the Welsbach Company did meritorious work in putting Gloucester City on the map. They are proud of their own showing. Early in the campaign a large sign, 10 x 20 ft., was erected inside the gate, upon which a daily record was kept of the subscriptions received from the various departments. Out of fifty-eight departments represented, twenty-eight reached their 100 per cent for a total of over $89,000. The Welsbach Company subscribed for $100,000, making the total Welsbach subscription to the Third Loan of $189,000, or two and a half times the Gloucester City quota.

Subscriptions from employees to the First Liberty Loan were $67,150, and to the Second Loan $40,850, making a total to date of over $200,000. This is a splendid showing considering that 70 per cent of the employees of the Welsbach factory are women and girls.

THE OKLAHOMA GAS & ELECTRIC COMPANY, Drumright division, has sent three more employees into Government service. They are I. J. Lyons, private, 363d Infantry; Hal Whittenburg, Camp Funston, Kansas, and S. H. Kurry, United States Navy.

Welsbach Employees Go Over the Top



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Taking the Zest out of Merchandising

A paramount essential to successful salesmanship is enthusiasm. There must be a zest to the work, stiff problems to attack and to conquer. Under existing conditions in the gas industry, there is little apparently to stimulate enthusiasm or to keep the salesman's wits active. Salesmanship has become a drab art.

This is the fault of the gas companies themselves. They have talked too gloomily, have discouraged new business too often, have kept too many salesmen worried about the permanence of their jobs, and have, in effect, broken faith with too many good salesmen by actually laying them off.

The fact that this condition has been permitted to develop will eventually prove a very expensive proposition to the gas industry. There may be time yet to remedy it to an extent and lessen the degree to which we have been set back.

The average gas company salesman has become a pretty disspirited individual. Liven him up. Give him some stiff jobs to tackle and give him credit when he brings them in. It is necessary to move with dispatch towards working up some enthusiasm at least, or the gas industry is apt to find itself in its time of need with no sales departments that are sales departments in anything beyond the mere conventional name.

Maintaining the Prestige of an Industry

The man who neglects to read advertisements is handicapping himself. A whole lot of real inspiration is sometimes compressed within a necessarily limited area of paid-for space.

We were reading one of a series of advertisements of a paper manufacturer in a popular magazine. We came across these sentences:

"And there is a sound reason behind it. It is keeping up appearances—a question of morale. The fight for prestige is stiffer to-day than it was before the war. And the harder a business has been hit by the war, the greater is its need of sure, unwavering morale. And after the war, Mr. Aldrich, the concern which has maintained its prestige, has got something more than money in the bank."

Are those statements founded on reason or not? A moment's reflection will convince anyone of their soundness. And how may the thought be applied tothe gas field?

We do not hear gas men nowadays proposing openly before their assembled fellows to shut down tight on merchandising. Such sentiments, undoubtedly craven and short-sighted, have become unpopular. But some still continue to cherish them in the inner recesses of their minds and practice them. Those that still do so openly conceal their real thoughts behind an evasion.

Their purpose is the disbandment of commercial organizations. "Why continue expensive new business departments?" they ask. "Selling gas has become mere child's play. It sells itself." And truly, it does.

But why not capitalize the opportunity to accomplish something that the real thinkers of the industry have been praying for for years—the installation of *real* gas-using appliances; appliances of the kind that will enable gas to perform to its best advantage and establish it in the public mind in the light of its true efficiency?

Instead of disbanding our commercial departments, why not hold on to them and deliberately make their task harder by giving them the higher-priced and higher-quality appliances to sell.

Preparing for Contingencies That Begin to Look Like Actualities

It has been indicated that a great many more draft registrants than was expected will be inducted into the military service within the next few months. The possibility of drawing from the deferred classifications even is not entirely remote.

The AMERICAN GAS ENGINEERING JOURNAL is inclined to believe that these will not be uncheerful tidings to a majority of those registrants who will be effected. It is a fact that many who were given deferred classification on account of occupations were more disappointed than pleased at the attitude their local boards took in their cases. Such men are not altogether convinced even yet that they are more useful where they are than where they would like to be.

But to employers, and particularly to gas companies, a different phase is presented. The hint as to possibilities should be sufficient to stir up activity towards increased efforts in training women and such other industrial reserves as may be available to take these men's places.

It looks now as if the country is to be temporarily skimmed quite clean of its select man-power. This is as it should be, and in conformity with the wishes of the whole country. The French and the English, who have fought magnificently, let no petty vanity stand in the way of their acknowledgment that the United States must win the war. We are fresh and they have been bleeding four years. So, since it is our job, the quicker it is done the better. If four million men can do it in a year, where it would require two years for two million men, then by all means let us get the four million as quickly as they can be handled. To do less would be a manifest injustice to those hundreds of thousands who are already absent from their normal pursuits.

The gas companies thus face two highly important problems: Decreased man-power and increased activity. The reserve must be called in and trained much more rapidly than was anticipated. The AMERICAN GAS ENGINEERING JOURNAL is well enough acquainted with the caliber of men who are managing the country's gas companies to know that both of the problems will be handled so expeditiously as to leave doubts, when all is over, whether they actually were problems or not.

Is This Electioneering?

Obviously, the proper time for an obituary is after the death. To the best of our knowledge, the National Commercial Gas Association still exists. Hence one is inclined to seek a motive that does not reveal itself behind the highly laudatory article in regard to the association's accomplishments and its great debt to its secretary that is published in the May 8 number of our Chicago contemporary.

Our first thought, of course, was that the Chicago publication wanted to be enterprising, and anticipating events that follow routine courses, and having them set up in type in advance ready for printing, is an old trick of journalism. We therefore searched in vain for a similar laudation of the American Gas Institute. Surely, since we are summarizing the great works of one National association, we cannot afford entirely to ignore the other.

The American Gas Institute has also done some big things. And it has been an important factor in the development of the gas industry. It deserves at least a word at parting.

"The Chicago periodical," readers might suggest, "is essentially a commercial publication. It is not strange that it should give the commercial association a send-off at parting and ignore the more technical Gas Institute."

This is not so. Whatever be the opinion of others, the Chicago periodical considers itself an engineering as well as a commercial publication. It has advertised this fact in its columns. It therefore has a responsibility to both sides.

As stated before, the gas man must seek a deeper motive than the obvious for this premature obituary.

The first words of the first paragraph of this remarkable article constitute a name, and the name is that of the present secretary of the National Commercial Gas Association.

Further down we learn that "it is due to his *untiring* work, his *natural enthusiasm* and his *splendid executive ability* that the organization continued to grow and prosper, until the membership now, etc. . . . ." "Each year the board of directors *changes*, and while the directors have for the past three or four years met on an average of *once a month*, it has been for a general review of the association's activities, and the details of management have *all been left in the hands of the secretary*."

There is more, but we have quoted enough. It re-

minds us of the type of literature we receive when our ward is about to elect a new alderman. And it must be remembered that the gas industry is about to elect a rather high-salaried secretary-manager for an amalgamated gas association.

Now let us make ourselves perfectly clear. The AMERICAN GAS ENGINEERING JOURNAL has no particular preference as to who this secretary-manager will be. That is the affair entirely of the membership of the new association. The JOURNAL has in previous issues defined a type of man that in its opinion should be selected. But a hundred men of the type defined could easily be found in the gas industry.

The JOURNAL's objection to the kind of activities this premature obituary represents is that it does not strike it as being in very good taste. Of all the men in the gas industry who should, in its opinion, keep themselves out of the limelight to as great an extent as possible, the secretaries of the existing National gas associations should be the foremost.

Any inclination to do otherwise might be deemed an evidence that someone is looking for a job. And the gas man is not going to give this particular job to anyone just because he happens to want it. He is going to select the man who in his judgment is best fitted to fill this highly important post. This man may be either the present secretary of the American Gas Institute or the present secretary of the National Commercial Gas Association, or neither.

What Are You Doing for Those Who Are Absent?

There are few gas companies, if any, from which some of the force have not gone forth to military or naval service.

We know that these men like to know that those they left behind continue to think of them, are interested in what they do and want to keep in touch with them. This JOURNAL has had occasion to communicate with various men who went into the service, strangers, to the best of our knowledge, to the JOURNAL and every member of its organization. The communications were in the nature of mere formal inquiries. Yet the responses that come back were remarkable, and almost astonishing in their warmth and in the appreciation they revealed.

Some of these men are lonely; bitterly so. This is not to be wondered at. As a general thing, they are the citizen, not the soldier, type, the kind of men whose ideal in life is to establish a home and devote their whole lives and energies to bringing up children of the kind that bring pride to the parents and benefits without limit to the whole social community. Their tastes are contrary to the adventurous life that characterizes the soldier. Only stern duty could impel them to tie up with a life so diametrically opposite to their natural inclinations.

They are, no doubt, finding the period of transition hard. Each shaft that brings their memories back to the life they have left comes as a ray of light to them, even if that shaft comes from the hand of what to them was a stranger.

Some gas companies are following their absent workers up closely. Clubs are organized among their employees to knit for them, to correspond with them, to send them tobacco, etc. Every gas company should carry along some such activity. It costs practically nothing in money, but it has a big value in the happiness it brings into the lives of men who have forsaken all comforts that they value and personal safety, that the traditions in which they have been brought up might endure.

A Dearth of Information on Timely and Vital Problems

What is going on in the manufacturing plants? We know that there is greatly increased activity. Superintendents and chemists are wrestling with problems hitherto new to them. In their prompt solution the nation, the gas industry and those mounting hundreds of thousands of American soldiers in France are vitally interested.

These superintendents and chemists carry grave responsibilities on their shoulders. Are they working together, shoulder to shoulder, as one magnificent unit, each holding out the helping hand toward the other, perhaps a thousand miles away, considering themselves but links in a great chain to most efficiently discharge the responsibilities the times have put upon them? Or are they merely hundreds of little isolated groups, each working alone to the one end without any assistance from each other.

These men are not by tastes and inclinations writers. But they owe it to their nation, their industry and those mounting hundreds of thousands of soldiers to become writers to-day. A brief discussion properly distributed of the problems met with and solved in the plant up in New England might be the means of putting the plant out in Michigan six months nearer to maximum toluol production and vice versa. Nor is the interest or the war service confined to munitions production alone. Efficient domestic and industrial service has become a war service. We are making gas by strange methods and from perplexing coals. What one works has learned should be placed at the service of other works.

The manufacturing plant superintendent or chemist should bring his findings to the attention of his coworkers. The technical gas journal provides him an available means of doing so.

NEW YORK COMPANY INFORMS ITS CONSUMERS OF ITS NEW APPLIANCE INSPECTING SERVICE AND INCIDENTALLY PREACHES MANTLE LIGHTING

Spring Gas Range Session in Illinois Looks Favorable

The spring gas range season in Illinois bids fair to be a prosperous one, the Public Service Company of Northern Illinois reports in its house organ, the *Public Service Lumen*.

"There has been considerable building in sections of the company's territory, especially in the West. Cicero furnishes a particularly notable example. Practically all new houses are equipped for gas and electric light as well. The method of advertising gas ranges this year provides for the exploitation of no one stove. Gas heaters which were sold in large numbers during the coal shortage of January and February, also during the early spring months, met a demand. The same is true of water heaters. Both the automatic and tank type of these devices have been pushed during the past few months, and it is intended to keep up the movement through the summer.

Tendency of Bakers to Take on Sidelines Opens Wide Field for Gas-Fired Coffee Roasters

Chicago Company Capitalizes Fact That Its Coffee Is Gas Roasted—One Big Baker to Whom the Sideline Has Become an Equal Branch of the Business

One of the big Chicago baking companies, driven to desperation by the many difficulties imposed on that industry since our entrance into the war, has just solved the great wartime problem of making both ends meet and incidentally has opened up a new and fertile field for the industrial gas salesman.

When the baking of bread became unprofitable the company turned to coffee roasting as a side line, but in four months the side line assumed such proportions that it has practically been made a partner in the business. The experience of this company should demonstrate to the gas man the fact that thousands of other bakers throughout the country are similarly situated and could similarly profit through the creation of a coffee-roasting addition to the bakery. It might be said in passing that gas is the most popular coffee-roasting fuel; so much so, that the Phul-Webb Company, one of the biggest and highest grade coffee roasters in Chicago advertises on all its wagons and even on its stationery: "Gas-Roasted Coffee."

Need of Side Line to Help Out in Overhead

The situation in the baking industry, so far as coffee-roasting possibilities are concerned, will perhaps be best understood through an accounting of the experience of the pioneer in this field, the Heissler & Junge Company.

Way back in 1868 the Heissler & Junge Company began baking bread. In due course their product, "Holsum Bread," became one of the most popular brands in Chicago, and needless to say, the company cashed in on the great expense to which it had gone in advertising the trade name "Holsum."

Then came the war, rising cost of production, innumerable Federal food regulations, a press and public opposed to the idea of advancing prices, so far as the "staff of life" is concerned, and other things that did not tend to make the life of the baker more pleasant. Confronted with these conditions, the Heissler & Junge Company began to seek "a way out."

After much meditation and investigation the firm decided a profitable side line would provide that way out, and for that side line it chose coffee, a foodstuff, the popularity of which is excelled only by bread, but which, for the present at least, has the advantage over the baker's product in that it is one of those rare things the cost of production of which has declined rather than advanced since our entrance into the war.

Judicious Advertising, of Chicago, in discussing the event, says that this is probably the first case on record of a baker selecting coffee-roasting as a side line. The Heissler & Junge Company, however, made the addition to its business the basis for an extensive newspaper advertising campaign, and reports that excellent results have accrued.

The baking company was so equipped in many respects that a great part of the expense ordinarily necessary for launching a new enterprise was saved in this case. Thus:

1. The company already had an established trade name. Instead of having to market an entirely new brand, it merely created a twin for "Holsum Bread," and called it "Holsum Coffee."

2. The company already had its delivery system, and the addition of coffee meant practically no new expense along that line.

3. For the most part the company had its clientele established in that nearly all the grocers who handled "Holsum Bread" readily took to "Holsum Coffee."

DAILY ROASTING AND DELIVERY

In addition to all these advantages over both the average wholesale baker and the coffee roaster, the Heissler & Junge Company created for itself the further and greater advantage of an entirely new system of selling coffee, namely, roasting and delivering it daily.

Big display newspaper advertisements announced:

"Coffee Delivered to You One Day After It Is Roasted."

Subsequent advertisements told this interesting story:

"Roasted Yesterday, Delivered Fresh to Your Grocer Every Day."

The success of this advertising campaign was instantaneous, says *Judicious Advertising*. This despite the fact that the general public is unaware of the rapid deterioration of the quality of coffee after roasting and especially after grinding. The firm, no matter where it is, which puts its stake on the "fresh daily" idea as applied to coffee, will be further aided by an educational campaign soon to be launched by the National Coffee Association of Coffee Roasters.

At its recent annual convention in Chicago the members of this association agreed almost unanimously that coffee loses its flavor and strength every day of its existence after having been roasted, and particularly if ground. The association has therefore devised a special home coffee grinder and has appointed a permanent committee to introduce it to the housewives of the country, with the advice that she buy her coffee frequently and in small quantities if she wants the best there is in the bean, no matter what the grade of the coffee.

The daily roasting plan proved particularly attractive to the hotel and restaurant trade. Most such establishments use so much coffee that the Heissler & Junge plan enabled them constantly to serve coffee less than forty-eight hours from the roasting oven. Some of the big hotels and restaurants use as much as 600 lb. of coffee a week. The success of the "fresh roasted daily" plan of selling coffee, when it is known that within a month after this campaign was launched, the baking company was selling at least a ton of coffee every day, and some days the sales ran as high as 5,000 lb.

Verily, it behooves the baker to look into the coffee business. And it behooves the gas man to look into the baking business.

Milwaukee Company Offers Coke in Fuel Emergency

Because of the scarcity of all kinds of fuel, pending the arrival of lake shipments from the East, the Milwaukee (Wis.) Gas Light Company has offered to supply coke for a limited period in 1-ton lots to all who need it, regardless of whether they are classed as "coke customers." During the fuel emergency it has been necessary for all dealers, including the gas company, to serve only those who have been regularly on the list of customers for a certain period, but for a short time this rule, so far as the gas company is concerned, will be suspended.

Portland Companies Move Into New Quarters

The offices of the Portland Gas & Coke Company and the Pacific Power & Light Company moved to the Failing Building, corner of Fifth and Alder Streets, Portland, Ore. Sales and display rooms of the gas company are in the basement of the building. Cashier's offices are arranged on the ground floor and general offices of the two companies have been fitted up on the second, third and fourth floors.

Guy W. Talbot, president of both concerns, has taken a lease of the premises for a five-year term. Offices of the Pacific Power & Light Company were formerly in the Spalding Building, while the Portland Gas & Coke Company has been quartered at Fifth and Yamhill Streets for many years.

Ample floor space is afforded for the display of gas stoves and fixtures, and the general offices are commodious and well lighted.

Officials and employees of the two companies celebrated with a house warming on the evening of May 8. An elaborate program of amusements, embracing music, dancing, cards and a supper, was arranged by the committee in charge.

Rochester Consumers to be Supplied With April Issue of Gas & Electric News

In the interests of its new $4,000,000 stock issue the Rochester Railway & Light Company will distribute 87,000 copies of the April number of *Gas and Electric News*, its monthly publication. The issue is slightly larger than usual and contains special articles showing the financial status, organization and work done by the company. The magazine is published under direction of Frederick W. Fisher, manager of the company's educational department.

Gas & Electric Merger Authorized

The New York State Public Service Commission has authorized the Norwich Gas & Electric Company, the Oneonta Light & Power Company and the Homer-Cortlandt Gas Light Company to merge with the Ithaca Gas & Electric Corporation, the latter having acquired the entire capital stock of the three companies. The commission also has approved the acquisition by the Associated Gas & Electric Company of $168,300 capital stock of the Ithaca corporation.

Increase in Rate Sought By Albany Municipal Plant

The Municipal Gas Company, of Albany, N. Y., has filed with the public service commission a petition asking for authorization to charge an increased rate and to put into operation a sliding schedule of rates which provides for a maximum increase of a little less than one-third raise over the present rate.

The company asks permission to charge:

For the first 10,000 cu. ft., $1.30 per 1,000.

For the next 10,000 cu. ft., $1.17 per 1,000.

For the next 30,000 cu. ft., $1.04 per 1,000.

Gas is now sold in this city at the rate of $1 per 1,000 cu. ft.

Campaign for Prompt Payment of Bills Bringing Good Results

Placing the problem before the public and asking their completest co-operation is the method used by Ralph Elsman, general manager of the Kings County Lighting Company, Brooklyn, N. Y., to help solve the present stringent situation. Mr. Elsman started a publicity campaign, making as his first point the prompt payment of bills. All of the local papers willingly extended their co-operation when the situation was brought to their attention, and the campaign already is having a beneficial effect.

Mr. Elsman in his statement to the newspapers quoted from President Wilson's letter to Secretary McAdoo regarding public utilities, and declared that it would be aiding the Kings County Lighting Company in maintaining its standard of efficiency by complying with the President's request. Although the campaign has been in effect only a short time, the results were noticeable almost from the first, proving conclusively to Mr. Elsman that wide publicity and a campaign of education would bring favorable results.

East Ohio Company Provides Benefit and Annuity Plan for Employees

A benefit and annuity plan for its workers in its employ over a year has been announced by the East Ohio Gas Company in a circular letter. The company employs 3,000 men and women.

Annuities offer regular allowances for employees sixty-five years or over after twenty years of service and special provisions are made for retiring employees under that age who have seen twenty and thirty years of service. Death benefits will be paid relatives of employees who die from sickness, including accidents off duty.

Sick benefits will be paid employees for disability of more than seven days, where salary is not continued during sickness.

These provisions are in addition to the compensations guaranteed employees under the workmen's compensation law.

Chicago Rate Case Deferred to May 23—Committee Appointed to Investigate Quarrel of Attorneys in $10,000,000 Suit

The Chicago City Council at its meeting May 6 refused to reinstate Donald R. Richberg, during the last three years special attorney for the city in gas litigation, who had been discharged from the services of the city a few days before by Corporation Counsel Ettelson.

At the same time that the council was taking this action the hearing before the Illinois Public Utilities Commission on the request of the Peoples Gas Light & Coke Company for an increase of 30 per cent in rates for gas service came up. On the plea of attorneys for the city for additional time in which to study the matter the hearing was deferred to May 23.

The elimination of Attorney Richberg from the ten-million-dollar suit against the Peoples company may have an important bearing on that litigation, which has been in the courts for years. Richberg was accused by his superior, Corporation Counsel Ettelson, of prolonging the gas litigation for the primary purpose of stretching his fees from the city as far as possible. It has also been the contention of attorneys for the gas company that the case was being unduly delayed. Richberg is said to have blocked every effort to send the case to the Supreme Court of Illinois for final decision. It is probable the case will be expedited now.

Meanwhile the mud-slinging contest among the city attorneys continues unabated. The latest development is a veiled charge of a bribery offer made by Richberg against Ettelson.

That Richberg is out of the gas litigation in Chicago for good may be understood from his statement prior to the council meeting, that if the city council indorsed his discharge he would accept the aldermen's ruling. The council has so ruled.

Mr. Ettelson announces that hereafter he will personally take charge of the city's side of the case against the gas company.

The quarrel among the city hall men as to who shall represent Chicago in litigation against the Peoples Gas Light & Coke Company has spread to the council committee on gas. The committee on committees of the city council has named a new committee on gas, as follows: Alderman Capitain, chairman; Aldermen Nance, Richert, T. J. Lynch, Lipps and Littler. The last two named are the new members of the committee.

"Coal Week" From June 3 to 8

"Coal Week," the period from June 3 to 8, has been selected by United States Fuel Administrator Garfield for an intensive and specific drive on the early ordering of coal. The fuel organizations of the various States, the county chairmen of fuel committees throughout the nation, coal dealers, chambers of commerce, mine operators, and others are all called upon to do their utmost to make this week's drive a big success.

From some States has come the objection that the trouble about the coal supply does not come from the consumers, industrial or domestic, but from the dealers, who complain that they cannot get sufficient coal to deliver. In spite of

this, the Fuel Administration is very anxious that the early ordering campaign be vigorously pushed.

By accumulating a large volume of orders in the hands of the dealers it is expected that there will be demonstrated to every agency concerned in the distribution of coal the universality and urgency of the demand, and this, in turn, will give rise to a steady and increasing pressure for rapid and equitable distribution. This is particularly true as to the railroads and other transportation agencies. Every unfilled order for coal will at once become an active and pressing argument for increased distribution efficiency. By keeping coal orders constantly accumulating, the resulting pressure, it is believed, will have the effect of keeping production at the highest possible point during the summer months.

It is also felt that with the bulk of the year's supply of coal ordered well in advance, the various distribution agencies of the Government will be in a position equitably and properly to adjust the demands as between different communities. It will be possible accurately to gauge the increased demand and properly to divide the available supply.

Springfield Rebate May Be Used to Purchase War Savings Stamps

A suggestion which has gained the approval of a large number of citizens of Springfield, is that the 10 per cent refund on gas bills to be given the consumers by the Springfield (Ohio) Gas Company, be used for the purchasing of War Savings Stamps.

Midway Company Granted Franchise

The railroad commission has authorized the Midway Gas Company to operate in Los Angeles County under a franchise to be obtained from the authorities of that county, for the transmission and distribution of gas for light, heat and industrial purposes for forty years within a definite territory. The district is now partly served with gas by the Southern Counties Gas Company, the Los Angeles Gas & Electric Corporation and the Southern California Gas Company. The Midway company stated to the commission that it is about to purchase casing-head gas in different parts of Los Angeles County, which will result in the saving and conservation of gas purchased and in the conservation of fuel oil.

Bridgeton Company Granted Permission to Raise Rates

Permission to raise the rate for gas from $1 per 1,000 ft. to a net rate of $1.12½ has been granted the Bridgeton (N. J.) Gas Light Company by the board of public utility commissioners.

The application for permission to increase the rate was made by the company on Dec. 17, 1917.

The application was opposed by a hastily organized Citizens' Protective League, and there was also a committee appointed from the city council to look after the interests of the taxpayers in the matter.

The issue was argued at Camden last January.

The findings are as follows:

"The board, therefore, finds and concludes as follows:

"(1) That a war surcharge of 15 cents per 1,000 cu. ft. may be added to the existing rates, subject to a discount of 2½ cents per 1,000 cu. ft. on bills for gas sold through regular meters if said bills are paid within ten days after presentation.

"(2) These rates may be effective for sales made from May 1, 1918.

"(3) Acceptance by the company of the increases herein allowed will be taken as a stipulation that abrogation or modification of the war surcharge may be made as and if conditions as indicated by operating results warrant.

"(4) Beginning at the effective date of said schedule of rates, the company is to render reports monthly to the board showing the operating revenues, operating deductions excluding general amortization, non-operating income, income deductions and balance available for amortization, dividends and surplus, and amount appropriated for general amortization for each succeeding calendar month, with comparison with the figures for the corresponding month of 1917; and the board will retain jurisdiction of the emergency of war surcharges as here approved, for the purpose of modifying or abrogating them as and if the conditions change.

Make Your Plans to Attend the Organization Meeting of the American Gas Association

Plans for organizing the American Gas Association on June 6 are progressing most satisfactorily, and members are requested to attend the meeting to be held at the Engineering Societies Building, 29 West Thirty-ninth Street, New York, N. Y., on that day.

While the intention is to enroll as charter members of the new association the present members of the American Gas Institute and the National Commercial Gas Association, the committee, nevertheless, is desirous of having every member of these two present associations send in his enrollment blank at once. This is necessary in order to determine which members will continue their membership in the American Gas Association.

Gas Company Members Enrolled to May 15

Cities Service Co.	New York, N. Y.
National Gas, Elec. Light & Power Co.	Philadelphia, Pa.
American Gas Company	Philadelphia, Pa.
Montgomery Light & Water Power Co.	Montgomery, Ala.
Denver Gas & Electric Light Co.	Denver, Col.
Pueblo Gas & Fuel Co.	Pueblo, Col.
Greeley Gas & Fuel Co.	Greeley, Col.
Danbury & Bethel Gas & Elec. Lt. Co.	Danbury, Conn.
Northern Connecticut Light & Power Co.	Thompsonville, Conn.
Bristol & Plainville Tramway Co.	Bristol, Conn.
Frost Gas Company	Smyrna, Del.
Orlando Water & Light Co.	Orlando, Fla.
The Tampa Gas Co.	Tampa, Fla.
Atlanta Gas Light Co.	Atlanta, Ga.
United Gas & Electric Co.	New Albany, Ind.
Goshen Gas Co.	Goshen, Ind.
Warsaw Gas Co.	Warsaw, Ind.

The amalgamation committee recently organized a company membership committee, with a chairman in each State. These State chairmen are in communication with every gas company, and their efforts are meeting with an encouraging response. All holding companies, through a special committee, are being requested to take membership for all their gas properties. The manufacturers of gas appliances and gas apparatus are also being approached by separate committees.

Up to May 15 the companies shown in the accompanying table have enrolled as company members of the new association, in addition to which 500 enrollments for active individual membership has been received.

The morning of June 6 will be devoted to the organization of the new association, approval of the constitution and by-laws, election of officers and directors, and other general business.

The speakers' committee, consisting of Messrs. P. H. Gadsden, T. N. McCarter and George B. Cortelyou, has arranged a very interesting and important speakers' program for the afternoon session of June 6.

On June 7, the various sections of the new association will be organized. These several sections will hold parallel sessions in the Engineering Societies Building, 29 West Thirty-ninth Street, New York. All members are requested to attend these section meetings, at which time the proposed activities of the sections will be discussed and formulated.

An informal banquet, the only official entertainment provided for during the meeting, will be given at the Hotel Astor, Thursday evening, June 6, at 7 o'clock. Several prominent speakers have been secured for this occasion.

Members are requested to advise the amalgamation committee at once whether they will attend the organization meeting on June 6 and the number of banquet tickets they desire reserved. The entertainment committee must guarantee in advance the number of covers to provide for the banquet, and checks in payment for banquet tickets should be made payable and sent to Louis Stotz, 128 East Fifteenth Street, New York, N. Y.

AMALGAMATION COMMITTEE,
P. S. YOUNG, Chairman,
J. B. KLUMPP, Secretary.

Clinton Gas & Electric Co.	Clinton, Iowa
Charles City Gas Co.	Charles City, Iowa
Citizens Gas & Electric Co.	Waterloo, Iowa
Salina Light, Power & Gas Co.	Salina, Kan.
Rockland, Thomaston & Camden Street Railway Co.	Rockland, Me.
Bangor Gas Light Co.	Bangor, Me.
Worcester Gas Light Co.	Worcester, Mass.
Lynn Gas & Electric Co.	Lynn, Mass.
Old Colony Gas Co.	East Braintree, Mass.
Citizens Gas Light Co.	Quincy, Mass.
Newton & Watertown Gas Light Co.	Newton, Mass.
East Boston Gas Co.	East Boston, Mass.
Lowell Gas Light Co.	Lowell, Mass.
Malden & Melrose Gas Light Co.	Malden, Mass.
Suburban Gas & Electric Co.	Revere, Mass.
Brockton Gas Light Co.	Brockton, Mass.
Beverly Gas & Electric Co.	Beverly, Mass.
Fall River Gas Works Co.	Fall River, Mass.
Boston Consolidated Gas Co.	Boston, Mass.
Thornapple Gas & Electric Co.	Hastings, Mich.
Big Rapids Gas Co.	Big Rapids, Mich.
Niles Gas Light Co.	Niles, Mich.
Port Huron Gas & Electric Co.	Port Huron, Mich.
Water and Light Department	Duluth, Minn.
Public Service Operating Co.	Owatonna, Minn.
Zenith Furnace Co.	Duluth, Minn.
Hattiesburg Traction Co.	Hattiesburg, Miss.
Meridian Light & Railway Co.	Meridian, Miss.
Southern Railway & Light Co.	Natchez, Miss.
City Light & Traction Co.	Sedalia, Mo.
Jackson County Lt., Ht. & Pr. Co.	Independence, Mo.
Fremont Gas, Elec. Lt. & Pr. Co.	Fremont, Neb.
Lincoln Gas & Electric Light Co.	Lincoln, Neb.
The Hastings Gas Co.	Hastings, Neb.
Cumberland County Gas Co.	Millville, N. J.
Public Service Gas Co.	Newark, N. J.
The Bridgeton Gas Light Co.	Bridgeton, N. J.
Atlantic City Gas Co.	Atlantic City, N. J.
Cape May Illuminating Co.	Cape May, N. J.
The Bronx Gas & Electric Co.	New York, N. Y.
Empire Gas & Electric Co.	Geneva, N. Y.
Municipal Gas Co.	Albany, N. Y.
Niagara Light, Heat & Power Co.	Tonawanda, N. Y.
Plattsburg Gas & Electric Co.	Plattsburg, N. Y.
New York & Richmond Gas Co.	Stapleton, N. Y.
Albany Southern Railroad Co.	Rensselaer, N. Y.
Northern New York Utilities Co.	Watertown, N. Y.
Troy Gas Co.	Troy, N. Y.
Rome Gas, Electric Light & Power Co.	Rome, N. Y.
Brooklyn Borough Gas Co.	Coney Island, L. I., N. Y.
Malone Light & Power Co.	Malone, N. Y.
Central Hudson Gas & Electric Co.	Poughkeepsie, N. Y.
Rockland Light & Power Co.	Nyack, N. Y.
Peoples Gas & Electric Co.	Oswego, N. Y.
Nassau & Suffolk Lighting Co.	New York, N. Y.
Kingston Gas & Electric Co.	Kingston, N. Y.
Syracuse Suburban Gas Co.	East Syracuse, N. Y.
Ogdensburg Gas Co.	Ogdensburg, N. Y.
Toledo Railways & Light Co.	Toledo, Ohio
Trumbull Public Service Co.	Warren, Ohio
Defiance Gas & Electric Co.	Defiance, Ohio
Penn Central Light & Power Co.	Lewistown, Pa.
Athens & Sayre Gas Co.	Sayre, Pa.
Bucks County Public Service Co.	Newtown, Pa.
Northern Central Gas Co.	Williamsport, Pa.
Lebanon Gas & Fuel Co.	Lebanon, Pa.
Philadelphia Suburban Gas & Elec. Co.	Jenkintown, Pa.
Luzerne County Gas & Electric Co.	Kingston, Pa.
Philadelphia Suburban Gas & Elec. Co.	Philadelphia, Pa.
Carbondale Gas Co.	Carbondale, Pa.
Blackstone Valley Gas & Electric Co.	Woonsocket, R. I.
The Pawtucket Gas Co.	Pawtucket, R. I.
Mitchell Power Co.	Mitchell, S. D.
Huron Light & Power Co.	Huron, S. D.
Bristol Gas & Electric Co.	Bristol, Tenn.

Knoxville Gas Co.	Knoxville, Tenn.
Chattanooga Gas Co.	Chattanooga, Tenn.
Nashville Gas & Heating Co.	Nashville, Tenn.
Memphis Gas & Electric Co.	Memphis, Tenn.
Burlington Light & Power Co.	Burlington, Vt.
Lynchburg Traction & Light Co.	Lynchburg, Va.
Newport News & Hampton Railway, Gas Electric Co.	Newport News, Va.
Petersburg Gas Co.	Petersburg, Va.
Spokane Gas & Fuel Co.	Spokane, Wash.
Portage American Gas Co.	Portage, Wis.
Waukesha Gas & Electric Co.	Waukesha, Wis.
United Gas Improvement Co.—Holding Company	Philadelphia, Pa.
Allentown-Bethlehem Gas Co.	Allentown, Pa.
Burlington Gas Light Co.	Burlington, Iowa
Charleston Consolidated Ry. & Lt. Co.	Charleston, S. C.
Chester County Gas Co.	West Chester, Pa.
Concord Light & Power Co.	Concord, N. H.
Consumers Gas Co.	Reading, Pa.
Counties Gas & Electric Co.	Philadelphia, Pa.
Des Moines Gas Co.	Des Moines, Iowa
Fulton County Gas & Electric Co.	Gloversville, N. Y.
Harrisburg Gas Co.	Harrisburg, Pa.
Lima Gas Light Co.	Lima, Ohio
Nashville Gas & Heating Co.	Nashville, Tenn.
New Gas Light Co.	Janesville, Wis.
Northern Indiana Gas & Electric Co.	Hammond, Ind.
Northern Liberties Gas Co.	Philadelphia, Pa.
Omaha Gas Co.	Omaha, Neb.
Pensacola Gas Co.	Pensacola, Fla.
Peoples Gas Light Co.	Manchester, N. H.
Philadelphia Gas Works	Philadelphia, Pa.
St. Augustine Gas & Electric Light Co.	St. Augustine, Fla.
Savannah Gas Co.	Savannah, Ga.
Sioux City Gas & Electric Co.	Sioux City, Iowa
Sioux Falls Gas Co.	Sioux Falls, S. D.
Syracuse Lighting Co.	Syracuse, N. Y.
The United Gas Improvement Co.	Vicksburg, Miss.
Peru Gas Co.	Peru, Ind.

MANUFACTURERS OF GAS APPLIANCES AND APPARATUS ENROLLED TO MAY 15

Ruud Manufacturing Co.	Pittsburgh, Pa.
Comstock-Castle Stove Co.	Quincy, Ill.
United Lead Co.	New York, N. Y.
Wm. H. Crane Co.	New York, N. Y.
Superior Meter Co.	Brooklyn, N. Y.
W. W. Barnes	New York, N. Y.
The Mead Gas Heater Co.	Delawanna, N. J.
Union Stove Works	New York, N. Y.
Isbell-Porter Co.	Newark, N. J.
The Roberts Brass Mfg. Co.	Detroit, Mich.
Detroit Stove Works	Detroit, Mich.
Ohio State Stove Co.	Columbus, Ohio
Stacey Bros. Gas Construction Co.	Cincinnati, Ohio
Cruse-Kemper Co.	Ambler, Pa.
Kitson Co.	Philadelphia, Pa.
The Baltimore Gas Appliance & Mfg. Co.	Baltimore, Md.
Humphrey Co.	Kalamazoo, Mich.
Reynolds Gas Regulator Co.	Anderson, Ind.
Minneapolis Heat Regulator Co.	Minneapolis, Minn.
Roberts & Mander Stove Co.	Philadelphia, Pa.
Cleveland Rotary Meter Co.	Cleveland, Ohio
Eclipse Gas Stove Co.	Rockford, Ill.
Pittsburg Water Heater Co.	Pittsburgh, Pa.
General Gas Appliance Co.	New York, N. Y.
Welsbach Co.	Gloucester, N. J.
Steere Engineering Co.	Detroit, Mich.
The Michigan Stove Co.	Detroit, Mich.
B. F. Drakenfeld & Co., Inc.	New York, N. Y.

Receiver Planning Sale of Holland Plant

The Grand Rapids Trust Company, trustee in bankruptcy, has asked permission in Judge Sessions' court to sell the Holland (Mich.) Gas Plant.

Increase Requested by Greensboro Company

Advance in the charge for illuminating and cooking gas is desired by the north Carolina Public Service Company, Greensboro, N. C., and formal petition has been laid before the city commissioners. The present rate is $1.35 and an increase of 25 cents is asked.

The proposed gas rates are as follows: $1.60 per 1,000 cu. ft. for the first 10,000; $1.35 per 1,000 for the next 15,000; $1.10 per 1,000 for the next 25,000, and 95 cents per 1,000 for the next 50,000. A discount of 10 cents per 1,000 ft. would be allowed, as at present, if the bill were paid on or before 5 o'clock p. m. of the 10th of the month following the date of the bill.

Flat Rate of 60 Cents for Indianapolis Consumers

The Public Service Commission of Indiana has just re-established the old franchise rate for artificial gas, supplied the consumers of Indianapolis by the Citizens Gas Company, because of the war exigencies that confront the company, and 60 cents per 1,000 cu. ft. to the small consumers hereafter will be the rate charged under the terms of the following order, which is given in part:

The Citizens Gas Company, Indianapolis, prays authority to increase, for a temporary period, the price of artificial gas to a flat rate of 60 cents per 1,000 cu. ft. of gas sold, said increase to be contingent on the enlargement, as hereinafter specified, of the company's facilities to render service.

Notice of the filing of this petition, together with copies of same and date of hearing, was served on the city of Indianapolis, the Indianapolis Chamber of Commerce, the Indianapolis Board of Trade, the Business Men's Association and the Indiana Manufacturers' Association, and wide notice was given through the local newspa-

The Southern Counties Gas Company at Long Beach, Cal., So Illuminates Its Offices That Selling Gas for Lighting Is Made Easier In That Less Verbal Description Is Necessary

GENERAL ILLUMINATION IS OBTAINED THROUGH USE OF NO. 1620½ WELSBACH KINETIC FIXTURES—C. E. Z. AND REFLEX LIGHTS AFFORD DECORATIVE EFFECTS ON COLUMNS

pers, affording all interested opportunity to be informed and appear.

In conformity with such notice, the matter came on for hearing before the Public Service Commission of Indiana on April 24, 1918.

The evidence discloses that the present maximum production capacity of the plants is approximately 11,000,000 cu. ft. of gas per day; that the high price of coal and the uncertainty of supply incident to war has resulted in abnormal demands on the company for service, gas becoming relatively a very cheap and reliable fuel; that this abnormal demand taxes to the utmost the maximum capacity of the plants; that the company is unable to meet all requirements for service; that it is desirable that said facilities be increased by the addition of forty ovens, thereby doubling its coal gas production capacity and raising the total maximum capacity of its generating facilities, including its water gas plants, to more than 15,000,000 cu. ft. of gas per day; that such additional facilities will enable them to render service to those demanding service for domestic, industrial and war-order purposes, except for the substitution of said gas for coal for general house heating; that the enlargement of facilities, as stated, will result in more satisfactory service to all patrons; that said additions will make possible a more even pressure and the maintenance of a higher average of heat units; that the Federal Government is making urgent demands on the company for the salvage of toluol and ammonia; that the company is in position to close a contract with the Wilputte Coke Oven Corporation for the installation of such additional facilities, under stipulation that said facilities shall be far enough advanced to completion by Dec. 1, 1918, as to be available for service on that date; that installation at as early a date as Dec. 1, 1918, is contingent on an option on silica brick used in the construction of said ovens, which expires on April 29, 1918; that the contract price for said forty ovens, together with the installation of facilities to handle by-products and furnish the required additional power, will cost approximately $1,258,000; that said cost is approximately 100 per cent in excess of what it would be in normal times; that said 100 per cent increase in cost is attributable to the present era of war prices; that it is not desirable for either the company or those served to have this 100 per

cent excess cost permanently added to capital; that the excess of more than $600,000 should be amortized so that in any future readjustment of rates on the basis of an evaluation, earnings would not have to be provided for said excess; that present rates should be adjusted to the end that said excess may be amortized in a five-year period or less; that the financial statement of petitioner for the year 1917 is such that it is unable to enlarge its facilities without an increase in rates; that petitioner did not earn any dividends by operation in 1917; that it did, however, pay dividends by drawing on its surplus, which on Jan. 1, 1917, was in excess of $200,000; that in meeting the obligations in 1917 said surplus was reduced to $77,536.92 as of Dec. 31, 1917; that its total revenues, including receipts from residuals for the year 1917, were $77,428.34 less than operating expenses; that there were deficits in January and February, 1918, but that a profit was shown in March, the first three months of 1918 showing a balance of $2,000 applicable to dividends; that the prayer of the company if granted would yield approximately $186,000 per year in added revenues, which would be supplemented by savings resulting from closing down the water gas plant except in the coldest weather or heaviest demand; that the cost of operation of said water gas plant is at times in excess of the realization from such gas generated thereby; that unless the prayer be granted, petitioner will be unable to obtain finances for said added facilities.

Aside from the record, which in itself is sufficient to justify the prayer, the commission has knowledge of conditions obtaining in Indianapolis. It is aware of the fact that the facilities of petitioner, which were ample to meet the requirements of the city in normal times, will, during the period when the high cost of coal and the uncertainty of supply drives many to the use of gas, be inadequate to meet the demand.

The situation is such that three unsatisfactory results are evident:

(1) The pressure and quality of gas is unsatisfactory.

(2) The inability of the company to furnish gas service threatens to retard the industrial growth of the city during the war period.

(3) The company is not able to meet, as it should, the imperative war demands of the Federal Government for salving the essentials for high explosives—toluol and ammonia—and also gas for munition plants.

The commission is also aware of the fact that the increase prayed for in gas rates would amount, generally, to approximately 8 per cent, whereas the advance in all other fuels may be placed at 100 per cent. The company pays approximately 100 per cent more for fuel and oils, but the record also shows that this is offset in large measure but not entirely by the increased prices realized in the sale of coke and some other by-products. The commission is further aware of the fact that the present 55-cent maximum rate is a lower rate for artificial gas than charged in any other city of like size in the United States, and that if the price for gas be increased to the 60-cent maximum of the original franchise, as herein prayed, the price of gas will still be considerably less than in other cities of like size in the country.

The commission, being fully advised, finds that the prayer of the company should be granted, but for a limited period and with certain stipulations; and it will be so ordered.

The increase in gas rates hereinafter authorized shall be in effect for gas furnished on and after the thirtieth day following the date of execution of a contract for the enlargement of applicant's manufacturing plant, and shall remain in effect until otherwise ordered by this commission, but on or before May 1, 1920, applicant shall appear before this commission to show whether such increase is still required on account of operating costs growing out of said plant enlargement, or on account of other unusual conditions affecting its operating costs. The law gives the commission the power to enter into an investigation at any time as to the reasonableness of rates.

An increase of all rates to a flat 60-cent basis is a departure from the usual practice of regulatory bodies, which generally provide lower and graduated rates for large and industrial users. The commission, however, is of the opinion that such a departure from the customary is warranted in this case, and that without such departure justice cannot be done. The demand for enlarged facilities arises largely from demands from industries and other large users of fuel who are finding gas much more dependable or more economical than coal, and it would be manifestly unfair to place on the small consumer of gas almost the full burden of providing such facilities. On the other hand, the added facilities should, as the testimony indicates, result in better pressure and quality of gas delivered to the small user. In the case of the large consumer the step or block rate would not result in as large a differential as appears on first glance, while on the part of the small consumer it is possible that during the war period, when the Government is demanding the extraction of toluol—the greatest heating value in gas—and when the demand for gas is abnormal, an evening of pressure and quality tend actually to reduce what on its face is an 8 per cent increase in rates.

The excess above normal cost, due to war era prices, of said enlargement to petitioner's facilities will be at least $600,000. The evidence indicates that the interest on securities, on the basis of estimates on financing the installation submitted at the hearing but not herein passed on, would amount to $375,000 in a five-year period and that the discount, which also is not herein passed on, would amount to $225,000. The two items aggregate $600,000, but this figure is considered excessive and higher than will be necessary. The record of the hearing also carries estimates that the increase in rates herein prayed would produce, if continued over a five-year period, $900,000 or more. There would appear to be between these two figures a profit of more than $300,000 to the company. It is the hope of the commission that the period of continuing the increased rate shall be less than five years. The order will, therefore, provide for absorption — by amortization of war-time excess in cost of construction—of a very heavy percentage of the profits arising from the increase herein authorized; this provision appearing in the order in the form of a requirement for amortization of at least $100,000 of this excess cost per year. The testimony indicates that the company intends to amortize

$600,000 of excess costs in a period of at least five years. The provision of $100,000 per annum, therefore, only stipulates a minimum.

The commission feels justified in going farther in an expression of the opinion that unless the company does take such steps to increase its capacities it will fail in its service obligations to the city and the people of Indianapolis.

It is therefore ordered by the Public Service Commission of Indiana, That petitioner be, and it is hereby, granted authority to suspend on the thirtieth day following the execution of a contract for the enlargement of applicant's generating plants, as hereinbefore specified, the present existing schedule of rates and charges for artificial gas.

It is further ordered, That petitioner be, and it is hereby, ordered to put into effect on such date a flat rate of 60 cents per thousand of cubic feet for gas sold on and after said date, said rate to continue in effect until the further order of the commission.

It is further ordered, That petitioner appear on or before May 1, 1920, before this commission, and whenever thereafter the commission shall direct, to make showing whether such increase is still required on account of obligations growing out of the present proposed enlargement of plant facilities or on account of other unusual conditions affecting its operating costs.

It is further ordered, That, beginning with the year 1919, the company set aside annually, and pay into a special fund, at least $100,000, the same to be applied to the amortization of the excess cost of the enlargements and additions herein provided for, and that the company shall thus reduce the capital charge of said added plant and equipment to a value of not more than $650,000, the same to be the value at which said added plant is to be carried on the books of the company and at which it shall be valued in any formal rate proceeding.

Increase Asked for Muscatine

An ordinance was recently submitted to the city council by the Muscatine (Ia.) Lighting Company stipulating that the price which shall be charged for heating and illuminating gas shall not exceed $1.50 per 1,000 cu. ft., and permitting the company to charge $1.60 if the bills are not paid by the tenth of each month.

Poudre Valley Company Gets Higher Rate

The State public utilities commission recently informed the Poudre Valley Gas Company, Fort Collins, Col., that it had granted the request for an increase in rates and that the new rate is effective beginning May 1. The rate for gas is now $1.25 per 1,000 cu. ft. for heating and illuminating gas.

Oswego Rates Increased 25 Cents

The price of gas will be increased from $1.40 to $1.65 per 1,000 cu. ft., according to a circular letter sent to consumers by the Peoples Gas & Electric Company, of Oswego, N. Y. Increase in the cost of labor and material is given as the cause.

Goshen Company Given Rate Increase

The public service commission at Indianapolis recently granted the Goshen (Ind.) Gas Company permission to add a 20 per cent surcharge to gas bills beginning May 1 and continuing for the period of the war, but not to exceed two years. The commission will require the company, however, to supply it with daily charts showing quality and pressure of the gas served to its consumers, and the order contains the warning that if they do not meet required standards the surcharge will be cut off.

J. H. Taussig and C. F. Zeek Awarded Edward Longstreths Medals of Merit

The Franklin Institute has recently awarded Edward Longstreth Medals of Merit to John Hawley Taussig, of Philadelphia, Pa., and Charles Franklin Zeek, of Pensacola, Fla., for their inventions embodied in a device for the automatic operation of water gas sets.

In the manufacture of water gas, a number of operations have to follow each other in regular succession at definite intervals. These different operations are controlled by valves that have previously been operated manually.

In the above device a clock mechanism operates a set of relays, which set in motion hydraulic valves that perform the required turning of the main valves in the machine, thus substituting a definite automatic operation for one depending upon the continued carefulness of the operator.

Personal Notes

LEWIS VINCENT, for the last fifteen years associated with the gas department of Riter-Conley Manufacturing Company, of Pittsburgh, Pa., has recently resigned his position as assistant gas engineer of that company in order to follow his profession independently as a consulting gas engineer. He has established offices in Pittsburgh, placing at the disposal of the general public his extensive experience gained in the design and construction of many of the most up-to-date coal gas plants, by-product recovery plants, gas holders and general gas apparatus.

E. D. BREWER, who was connected with the Atlanta (Ga.) Gas Light Company for the past ten years, is now in Columbia, S. C., with the Columbia Railway, Gas & Electric Company as commercial manager of the gas and electric departments. His offices are in the Arcade. During his connection with the Atlanta company Mr. Brewer held the position of assistant to the general manager for a period of five years. For seven years he was secretary of the Southern Gas Association.

DANA J. P. WINGATE died May 12 at Saranac Lake, N. Y., where he had gone for his health, at the age of thirty. He attended Harvard College, from which he graduated in the class of '14. On leaving college he went with the Boston Consolidated Gas Company, and when he was obliged to leave because of failing health he held the position of chief clerk of the transportation department. Mr. Wingate was a member of the Harvard Club, of Boston, and the Winchester Country Club.

THE BROWN INSTRUMENT COMPANY, Philadelphia, Pa., announces the opening of a new office in St. Louis at 2086 Railway Exchange Building on June 1, in charge of Paul H. Berggreen. On account of the demand for pyrometers and other instruments from the southwestern

section of the country, they found it necessary to appoint a representative for that district, which will enable them to give more prompt attention to customers in the vicinity of St. Louis.

THE UNITED GAS & ELECTRIC CORPORATION held its annual meeting recently, at which the following officers were elected: E. G. Connette, president; Francis T. Homer, vice-president; Arthur L. Linn, Jr., treasurer and assistant secretary; J. A. McKenna, secretary and assistant treasurer; M. D. Evans, assistant treasurer; G. F. Bauer, C. P. A., auditor, and George Bullock, chairman board of directors.

FREDERICK W. DINWIDDIE, former registrar of the Gardner, Mass., Water Works, recently assumed his new duties as paymaster at the plant of the Central Oil & Gas Stove Company.

THE CHESTER COUNTY GAS COMPANY, of West Chester, Pa., held its annual meeting of stockholders recently, at which the following directors were elected to serve during the ensuing year: J. R. Roop, Clarence Deshong, O. H. Cloud, John B. Crozer and E. F. Johnson. Directly after the stockholders' meeting, which was held in the offices of the company in the Delaware County Bank Building, the board of directors met for reorganization and named J. H. Roop as president and treasurer, and E. B. Johnson as secretary.

DENNIS J. BUCKLEY, who has been assistant treasurer at the Brockton (Mass.) Gas Light Company for about fifteen years, resigned his position recently. He will take up another line of business. He has been manager of the credit department and the collection department for the past year, and was connected with the company for twenty-six years.

CLARK R. GRAVES, who for the past six years has been local manager of the Lansing (Mich.) Fuel & Gas Company, filed his resignation in April with the C. H. Geist Company, owners of this public service utility, and it will take effect June 1. Mr. Graves has not as yet made plans for the future, and is undecided as to whether he will remain in Lansing. He has been actively and prominently identified with the business and civic affairs of the city. He took the initiative in the organization of the Lansing Rotary Club, and is its immediate past president. He is a sustaining member of the Chamber of Commerce, a member of the National Commercial Gas Association and secretary-treasurer of the Michigan Gas Association. Mr. Graves has had more than fifteen years' experience in the gas business. After

CLARK R. GRAVES

five years' service with the new business department of the Detroit City Gas Company he resigned to accept the position of commercial manager of the Atlantic City Gas Company, one of the concerns owned by the Geist company. Two years later he was promoted to manager of the Lansing company.

V. B. MCCONAHAY has resigned his position as manager of the Paulding (Ohio) Gas Light & Fuel Company, to accept a position as manager of the Paulding Municipal Light & Water Plant.

THE UNITED GAS IMROVEMENT COMPANY, of Philadelphia, Pa., recently held the annual meeting of the stockholders, at which the following directors were re-elected: Randall Morgan, William Wood, Morris L. Clothier, Effingham B. Morris, Thomas J. Dolan and Edward T. Stotesbury. At the reorganization meeting of the directors the following officers were continued: Samuel T. Bodine, president; Randall Morgan, vice-president and general counsel; Walton Clark, second vice-president; Lewis Lillie, third vice-president; W. F. Douthirt, fourth vice-president; Paul Thompson, fifth vice-president; G. W. Curran, ur tary and treasurer; I. W. Mo sistant secretary and treasure, and E. MacMorris, assistant treasurer.

M. N. MASCHKA, for the past three years with the business department of the Winona (Minn.) Gas Company, has taken a position with the Bemidji Gas Company as head of the commercial department, that has to do with the development of the service.

J. R. RAUDABAUGH, of Van Wert, a gas man of several years' experience, has been engaged as the manager of the Paulding (Ohio) Gas Light & Fuel Company, to succeed V. B. McConahay.

CHAUNCEY W. SMITH, who for the last three years has been employed by the Joplin (Mo.) Gas Company, has received the appointment of superintendent of the company, to become effective immediately upon the departure of John McMillan, whose resignation was noted in the April 27 issue of the AMERICAN GAS ENGINEERIN JOURNAL. Three years ago Mr. Smith received the appointment of chief clerk with the company. He received his first experience in the gas business under B. J. Graham, then superintendent, who resigned to accept the managership of a Port Huron, Mich., plant several months ago. Upon the resignation of F. W. Scoville as cashier of the company Mr. Smith was advanced to that position.

HARRY WEIDMAN, will succeed C. W. Smith as cashier of the Joplin (Mo.) Gas Company.

C. A. DAVIS, of Marlboro, Mass., was appointed manager of the Westfield Gas & Electric Works, to fill the vacancy caused by the resignation of Rudolph J. Hein. Mr. Davis, who is at present manager of the Marlboro Electric Company, the Marlboro-Hudson Gas Company and the Westboro Gas & Electric Company, will begin his work as soon as he is able to get released from his present contract, probably about June 1.

Iowa City Company Announces Increase

Unable longer to cope with the high cost of producing gas, the Iowa City Light & Power Com[illegible] has issued notices to its pa[illegible] notifying them of a raise in the price of gas from $1.15 net to $1.50 net. The increase to take effect from May 1.

Societies and Associations

THE ILLUMINATING ENGINEERING SOCIETY, New England Section, will hold the last meeting of the season Tuesday evening, May 21, at 8 o'clock, at the Engineers' Club, Boston. The following papers will be presented: "Plant Protection," by Edmund Leigh, chief of plant protection, Military Intelligence Bureau, Washington, D. C., and "Timely Aspects of Lighting," by M. Luckiesh, of Cleveland, Ohio. Both papers will be most interesting and appropriate. Engineers, electrical men, factory owners and all interested persons are cordially invited to attend and incidentally to partake of the buffet luncheon which will be served after the talks.

THE EMPLOYEES' ASSOCIATION OF THE KINGS COUNTY LIGHTING COMPANY had a 100 per cent attendance of all those off duty at the last meeting, when W. H. Jefferson, of the Cutler-Hammer Manufacturing Company, made an address on the Thomas meter for the work which the company is to do. Ralph Elsman, general manager of the lighting company, made a brief address, in which he congratulated the employees on their patriotism, as is shown by the subscriptions to the three Liberty Loans, more than $50,000 having been subscribed. "I am particularly pleased with the attendance here this evening," said Mr. Elsman, "because it shows that the association is really accomplishing the objects which we had in mind when we formed it. We of the Kings County Lighting Company have only one object in mind, and that is efficient service to our consumers, and I believe that these meetings will help to co-ordinate our efforts in reaching the high standard which we have set." Mr. Elsman also announced that he had inaugurated a publicity department for the company, which, he stated, he believed would prove of great advantage in enlightening the consumers as to the conditions which the company is facing. J. I. Blanchfield, assistant secretary of the company, announced that the management was arranging to equip club rooms at the main office of the company for all of the employees. Mr. Blanchfield said it was the hope of the management that the employees of every department would find time to spend a social hour or two at the club. The regular monthly dance of the employees was announced to take place within two weeks, and the entertainment committee stated that an excellent program was being arranged. B. A. Flanagan presided.

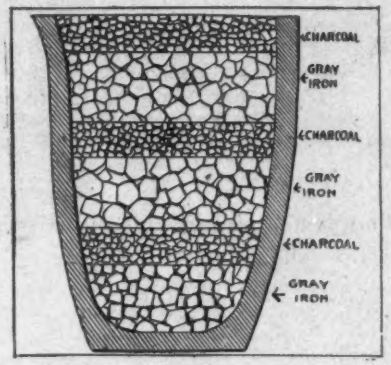
Joseph Dixon Crucible Company Explains How Easily Brass Foundry Can Turn Out Iron Castings With Available Equipment

How often it happens that you must have an iron casting in a hurry, and such a hurry, too, that you cannot wait to take the pattern to the man who makes your iron castings and wait till the use for the casting is almost over.

Everyone who operates a brass foundry but who has no iron foundry can make iron castings quickly and cheaply in his crucible furnace, for he has all the equipment necessary for making these hurry-up, important little iron casting jobs. You could have your casting almost before your pattern reached the iron foundry.

Gray iron of the better kind melts at 2327 deg. Fahr., and while this may look to your brass founder to be a high heat compared with the yellow brass or composition metal he regularly melts, the casting of gray iron in his graphite crucible is not given a second thought. The melting of gray iron in a graphite crucible is so simple that it is surprising that the practice is not more general.

Alternate layers of charcoal and gray iron, broken to pieces about the size of walnuts or larger (if it is not convenient to have pieces so small), are put in a Dixon graphite crucible and the melting is done in your pit brass furnace and an iron casting of high grade will be secured in a very little longer time than it takes to make a brass casting.



Use the bottom of an old brass crucible as a cover—this keeps the sulphur fumes and coal out of the crucible and also helps to make the melt more quickly.

Use a little Dixon's No. 2441 silica lead on your sand as a facing, and ten to one you will have as good if not a better casting than ever came into your shop. It is surprising how easily this can be done.

Lindsay Dividends Paid May 7—Annual Meeting June 16 at Chicago

The stockholders of the Lindsay Light Company were surprised last week to receive their dividends, though they were not due until May 31. One dollar on each $10 share was paid to stockholders on May 7. At the same time it was announced that the annual meeting of the stockholders would be held at Chicago on June 16 next.

It is reported unofficially that net earnings for the year will be between $600,000 and $650,000, or about 100 per cent on the common stock. This does not allow for the deduction of the Federal excess-profits tax.

Construction Notes

Rush Work on Fond du Lac Plant

Building operations are being rushed at the new gas plant of the Eastern Wisconsin Railway & Light Company, Fond du Lac, Wis., and it is expected that the plant will be ready about July 1. The work has been retarded to some extent until recently because

of the delay in shipment of material.

Men are now engaged erecting the steel work for the retort house, and the masons are preparing to do the brick work on that building.

Peoples Company Seeks Approval of New Bond Issue

The Peoples Gas Light & Coke Company, of Chicago, has applied to the Public Utilities Commission of Illinois for permission to issue general and refunding mortgage gold bonds to the amount of $1,500,000.

Bloomington Company Prepares for Next Winter by Increasing Storing Capacity for Coal and Oil

The Union Gas & Electric Company, Bloomington, Ill., is making preparations for the storage of 4,000 tons of coal to carry them through the coming coal shortage of next winter. Their storage bins now hold 2,000 tons, and they are increasing the capacity 100 per cent. They are also increasing their storage capacity for oil from 75,000 gal. to 140,000.

Work on Gas Benches Progressing at Rutland

Work is well under way relining two gas benches at the gas plant of the Rutland (Vt.) Railway, Light & Power Company. Material for one of the benches was ordered to be installed in 1917, but by careful usage it was possible to carry this bench through the winter. The water gas set is being used while the change is being made.

15,000,000 ft. Texas Gasser

Thirteen miles northeast of Ranger, Tex., the T. & P. Coal Company has a 15,000,000 gasser in sand found at 3,900 ft. The entire depth was made with a heavy Star machine.

Grand Rapids Company Increasing Storage Capacity for Coal

Hoping to start next winter with filled bunkers, the Grand Rapids (Mich.) Gas Light Company is increasing its storage capacity and laying in all the fuel they are able to obtain. At present they are able to obtain only about a sufficient quantity for present needs.

The gas company is selling from 40 to 50 tons of coke daily, but this is not near what would be required if all demands were filled. Orders are taken each morning, beginning at 8, and the day's supply is exhausted within little more than an hour.

Ready to Begin Wells North of Eufaula

R. H. Searcy and associates are about ready to begin their well 4 miles north of Eufaula, where this city gets its gas supply. These men have a 2,005-ft. gasser, which made a splendid test for the manufacture of gasoline if oil is not found there, and if another gas well of the caliber of the one the company now has is brought in they expect to build a gasoline plant, where they will manufacture gasoline.

Start on Plant to Produce Gas From Fuel Oil at Everett

The Interstate Engineering Company, Inc., has opened offices at 21 Clark Block, Everett, Wash. The officers of the company are: H. A. Fisher, president, Seattle, Wash.; I. Waring, secretary, Seattle, Wash.; G. W. Schultz, managing engineer, Seattle, Wash.; Edward R. Munz, mechanical superintendent; H. C. Aston, supervising engineer; A. L. Coffey, sales manager; Lacey Babos, mechanical draftsman.

"The company will manufacture a high carbon-gas from fuel oil, charcoal and chemical by-products, a cheaper method of manufacturing welding and cutting gas than was ever before known to science," said D. W. Smith, assistant general manager.

"The profits in the manufacture of high carbon-gas are tremendous. Welding and cutting of all kinds of metals with gas is in its infancy. Schools are springing up everywhere to instruct mechanics in the use of welding and cutting gas.

"Gas will universally be used for cutting and welding as soon as the demand can be supplied. Our company will remodel the old Everett brewery buildings and erect a new plant that will cost when completed $500,000. We will employ one thousand men within a year, and when the factory is completed will employ two thousand first-class mechanics.

"We will manufacture all of our own gas-making machines as soon as we can get our plant in shape. The first units are being built in Seattle for the Everett plant, and will be installed in Everett as soon as ready.

"We will also manufacture for sale automatic welding machines, welding torches, cutting torches and special machines for special work; also gas turbine engines, tanks, drums and valves.

"The brewery site of about five acres is a fine site for our plant. Work of remodeling it will begin at once."

Government May Finance Chicago Toluol Plant

According to rumors current on La Salle Street, the "Wall Street of Chicago," the Government is to finance a toluol plant of the Peoples Gas Light & Coke Company of Chicago to the extent of about $20,000,000. Officials of the company declined to discuss the report, although it was said at the gas company's office that some such proposition was under consideration at Washington. It is understood that the Government will take active measures, supplying capital where necessary, to stimulate the production of toluol at gas plants throughout the country.

Gas Holder Completed at Ottawa

The construction of an additional 200,000 cu. ft. gas holder at the Ottawa plant of the Public Service Company of Northern Illinois has just been completed and the holder is now in use. The Ottawa station now has a storage capacity of 300,000 cu. ft.

Aubyme Is Drilling With Good Gas Showing

The Aubyme Oil & Gas Company is now drilling on the Linds farm in the Garber field, Oklahoma. They are at a depth of 1,030 ft. and recently hit a big flow of gas. Every indication points toward bringing in a well soon.